T

0908-3926

SECTION I - IDENTIFICATION

EMERGENCY DIRECTORY
413-543-3381 (EASTERN TIME) 8:00AM-5:00PM
800-424-9300 (OFFHOURS) CHEMTREC

HMIS HEALTH 2
HMIS FLAMMABILITY 0
HMIS REACTIVITY 0
HMIS PROTECTION X

HEATBATH CORPORATION
107 FRONT STREET
INDIAN ORCHARD, MASS. 01151

PREPARED BY: THOMAS A. NADEAU
DATE: 10/6/89

PRODUCT NAME..... TEMPERING A
DESCRIPTION..... Heat treating salt.
DOT CLASS:SODIUM NITRITE MIXTURE (SODIUM NITRATE, SODIUM NITRITE AND POTASSIUM NITRATE) OXIDIZER NA 1487 RQ

SECTION II - HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENT	CAS NUMBER	PEL(MG/M3)	TLV(MG/M3)	%
POTASSIUM NITRATE	7757-79-1	N.E.	N.E.	40-50
SODIUM NITRATE	7631-99-4	N.E.	N.E.	1-10
SODIUM NITRITE	7632-00-0	N.E.	N.E.	40-50

N.E.=NOT ESTABLISHED N.A.=NOT APPLICABLE

SECTION III - PHYSICAL DATA

BOILING Point(F)..... decomposes SPECIFIC GRAVITY (H20=1)..... 2.15
VAPOR PRESSURE (mm Hg).....N.A. MELTING POINT..... 280 F
VAPOR DENSITY (Air=1)..... N.A. EVAPORATION RATE.....N.A.
SOLUBILITY IN H20..... complete. PH.....N.A.
APPEARANCE/ODOR.....odorless, pink powder.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT..... None. FLAMMABLE LIMITS.....None.
LOWER FLAME LIMIT..... N.A. HIGHER FLAME LIMIT..... N.A.
IN CASE OF FIRE: Use flooding amounts of water.
SPECIAL FIREFIGHTING PROCEDURES: If salt is molten, use dry sand. Wear protective clothing with self-contained breathing apparatus.
UNUSUAL FIRE HAZARDS: Decomposes rapidly when heated over 1100 F. Oxidizer-increases the flammability of organics, combustibles and easily oxidizable materials. Contact of hot salt with combustibles may cause fire. Hazardous fumes may be released under thermal decomposition.

SECTION V - REACTIVITY DATA

CHEMICAL STABILITY: STABLE CONDITIONS TO AVOID: temperatures >1100 F
INCOMPATIBLE MATERIALS: ammonium salts, cyanides, reducing agents, strong acids. combustibles.
DECOMPOSITION PRODUCTS: oxides of nitrogen under thermal decomposition.
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION VI - HEALTH HAZARD DATA

ROUTES OF ENTRY: inhalation, ingestion.

HEALTH HAZARDS (ACUTE,CHRONIC): Contains OXIDIZER. Contact with other material may cause fire. May cause eye, skin and respiratory tract irritation. May be harmful or fatal if swallowed. Avoid contact with eyes, skin or clothing. Avoid breathing dust.

CARCINOGENICITY: None. NTP?: No. IARC?: No. OSHA REGULATED?: No.

SYMPTOMS OF EXPOSURE: eye, skin and respiratory tract irritation. If ingested, may cause nausea, vomiting, cyanosis, headache and loss of consciousness. May react with secondary amines to form nitrosamines a potential carcinogen.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: not known.

FIRST AID: INHALATION: Move victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult,give oxygen. Get medical attention. EYES: Hold eyelids apart and flush with running water for at least 15 minutes. Get medical attention. SKIN: Wash affected area with soap and water. Remove contaminated clothing. If irritation persists, see a physician. INGESTION: If conscious, give plenty of water. Induce vomiting. Get medical attention.

SECTION VII - PRECAUTIONS/PROCEDURES

IN CASE OF SPILL: Sweep up material into a chemical waste container. Flush spill area with water.
WASTE DISPOSAL METHOD: Dispose in accordance with federal, state and local regulations.
PRECAUTIONS:Use with adequate ventilation. Store in a cool, dry place away from combustibles. Wear proper protective clothing when using this product. Wash thoroughly after handling.

OTHER PRECAUTIONS: Emptied containers of this product may contain hazardous vapors and residue. Clean thoroughly before reusing or discarding. Do not use a welding torch to cut container. Do not use for water or food storage.

SECTION VIII - SPECIAL PROTECTION

RESPIRATORY PROTECTION: Use NIOSH/MSHA approved respirator if dust, fumes or vapors are excessive. VENTILATION: provide good air dilution.
MECHANICAL EXHAUST..... X. PROTECTIVE GLOVES: heat-resistant type.
LOCAL EXHAUST..... X. EYE PROTECTION: face shield.
OTHER PROTECTIVE EQUIPMENT..... apron,boots, full cover work clothes.
WORK/HYGIENIC PRACTICES..... wash thoroughly after handling,launder clothes.

SECT IX -SARA TITLE III INFORMATION

HAZARDOUS COMPONENT	CERCLA RQ LBS.	SECT 302 TPQ LBS.	SECT 313 TOXIC	SECT.311/312 HAZARDS
POTASSIUM NITRATE	N.A.	N.A.	NO	A,C
SODIUM NITRATE	N.A.	N.A.	NO	A,C
SODIUM NITRITE	100	N.A.	NO	A,C

A=IMMEDIATE (ACUTE) HEALTH HAZARD B=DELAYED (CHRONIC) HEALTH HAZARD
C=FIRE HAZARD D=SUDDEN RELEASE OF PRESSURE HAZARD E=REACTIVE HAZARD

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SOLUBILITY IN H20..... complete. PH.....N.A.
APPEARANCE/ODOR.....odorless, pink powder.

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LOWER FLAME LIMIT..... N.A. HIGHER FLAME LIMIT..... N.A.
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CARCINOGENICITY: None. NTP?: No. IARC?: No. OSHA REGULATED?: No.

SYMPTOMS OF EXPOSURE: eye, skin and respiratory tract irritation. If ingested, may cause nausea, vomiting, cyanosis, headache and loss of consciousness. May react with secondary amines to form nitrosamines a potential carcinogen.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: not known.

FIRST AID: INHALATION: Move victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult,give oxygen. Get medical attention. EYES: Hold eyelids apart and flush with running water for at least 15 minutes. Get medical attention. SKIN: Wash affected area with soap and water. Remove contaminated clothing. If irritation persists, see a physician. INGESTION: If conscious, give plenty of water. Induce vomiting. Get medical attention.

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LOCAL EXHAUST..... X. EYE PROTECTION: face shield.
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WORK/HYGIENIC PRACTICES..... wash thoroughly after handling,launder clothes.

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SODIUM NITRATE	N.A.	N.A.	NO	A,C
SODIUM NITRITE	100	N.A.	NO	A,C

A=IMMEDIATE (ACUTE) HEALTH HAZARD B=DELAYED (CHRONIC) HEALTH HAZARD
C=FIRE HAZARD D=SUDDEN RELEASE OF PRESSURE HAZARD E=REACTIVE HAZARD

MSDS IDENTIFICATION NUMBER	DATE ISSUED	ISSUED BY	EMERGENCY PHONE NUMBER
TA-008	March 1, 1989	Environmental Engineering Department	Ulbrich 203-239-4481 Chemtrec 800-424-9300

TRADE NAME: High performance, heat resistant alloys

FORMULA: Alloy composed of varying concentrations of elements listed in Section II.

I. PRODUCT IDENTIFICATION

CHEMICAL NAME: See Section II for Alloy Designations

CHEMICAL FAMILY: Alloy

II. HAZARDOUS CONSTITUENTS

TITANIUM AND TITANIUM BASED ALLOYS
GROUP VIII

Titanium Grade I A25/A35; Grade II A40; Grade III A55; Grade IV A70/A75; 6Al-4V; 3Al-2.5V.

DANGER
INHALATION OF DUST OR FUME MAY CAUSE SERIOUS LUNG INJURY. SKIN, EYE AND MUCOUS IRRITATION MAY OCCUR.

- The titanium and titanium based alloy products identified above may contain in varying concentrations, the following elemental constituents: aluminum, iron, titanium and vanadium. For specific concentrations of these and other elements present, refer to the Material Safety Data Sheet (MSDS) for this product.
- Inhalation of metal dust or fume generated by the use of these alloys may cause adverse health effects such as reduced lung function, nasal and mucous membrane irritation. Exposure to dust or fume generated by the use of these alloys may also cause eye irritation, skin rash and effects on other organ systems.
- Chrome, nickel and some of their compounds are listed in the 3rd Annual Report on Carcinogens as prepared by the National Toxicology Program (NTP) as well as the International Agency for Research on Cancer (IARC) Monograph Series. The following information is a summary of findings reported to date:

Determination/Evaluation	Element or Certain Compounds Evaluated or Both (Identified by Element Shown) CHROME	NICKEL
Evidence of carcinogenicity to humans:	Sufficient	Limited
Evidence of carcinogenicity to animals:	Sufficient	Sufficient

- Avoid breathing dust or fume. If the use of this material produces dust or fume, use appropriate ventilation controls, personal protective equipment or both. For additional information refer to the Material Safety Data Sheet (MSDS) for this product.

NOTICE: SECTION 313
Some of the previously listed chemicals are subject to annual reporting of releases into the environment under Section 313 of the Emergency Planning and Community Right-To-Know-Act of 1986. It is the responsibility of the user to verify whether or not his or her facility is in compliance with all Federal and State Environmental regulations.

NOTICE: CALIFORNIA LIST
Our Material Safety Data Sheets (MSDS) have been reviewed for inclusion of any chemicals listed under the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Proposition 65). We at this time do not report any of the "listed" chemicals as constituent components in any alloys currently processed by our company.

ALLOY	UNS No.	CONSTITUENT(S) % Maximum unless otherwise shown. C	N	Fe	H	O	V	Al	Ti	Other	DENSITY lbs/cu in	(approx.) MELTING PT. degree (F)
GRADE I A25/A35	N/L	.10	.03	.20	.015	.18			BAL		.163	3000
GRADE II A 40	R50400	.08	.03	.30	.0125	.20			BAL		.163	3000
GRADE III A 55	R50550	.08	.05	.30	.015	.30			BAL		.163	3000
GRADE IV A70/A75	R50700	.08	.05	.50	.015	.40			BAL		.164	3000
6Al-4V	R56400	.08	.05	.25	.015	.20	3.5/4.5	5.75/6.75	BAL		.160	3000
3Al-2.5V	R56320	.05	.02	.30	.015	.18	2.0/3.0	2.5/3.5	BAL		.160	3000
CAS Number		7440-44-0	7727-37-9	7439-89-6	1333-74-0	7782-44-7	7440-62-2	7429-90-5	7440-32-6			
Contaminant & Exposure Limits		Not Listed	Not Listed	As FeO Fume As Fe	Not Listed	Not Listed	Dust (V_2/O_2) Fume (V_2/O_2)	As Dust As Fume	NONE			
(mg/m3) PEL TLV				10 5			0.5 .05 .1 .05	0 10 0 5	NONE			

MSDS IDENTIFICATION NUMBER	DATE ISSUED	ISSUED BY	EMERGENCY PHONE NUMBER
AA-009	March 1, 1989	Environmental Engineering Department	Ulbrich 203-239-4481 Ch[redacted]

TRADE NAME: Aluminum Alloys

FORMULA: Alloy composed of varying concentrations of elements listed in Section II.

I. PRODUCT IDENTIFICATION

CHEMICAL NAME: See Section II for Alloy Designations

CHEMICAL FAMILY: Alloy

II. HAZARDOUS CONSTITUENTS

COMMON WROUGHT ALUMINUM ALLOYS
GROUP IX

Aluminum 1100; 3003; 5005; 5052.

DANGER
INHALATION OF DUST OR FUME MAY CAUSE SERIOUS LUNG INJURY. SKIN, EYE AND MUCOUS IRRITATION MAY OCCUR.

- The common wrought aluminum alloy products identified above may contain, in varying concentrations, the following elemental constituents: aluminum, chromium, copper, magnesium, manganese and silicon. For specific concentrations of these and other elements present, refer to the Material Safety Data Sheet (MSDS) for this product.
- Inhalation of metal dust or fume generated by the use of these alloys may cause adverse health effects such as reduced lung function, nasal and mucous membrane irritation. Exposure to dust or fume generated by the use of these alloys may also cause eye irritation, skin rash and effects on other organ systems.
- Chrome, nickel and some of their compounds are listed in the 3rd Annual Report on Carcinogens as prepared by the National Toxicology Program (NTP) as well as the International Agency for Research on Cancer (IARC) Monograph Series. The following information is a summary of findings reported to date:

Determination/Evaluation	Element or Certain Compounds Evaluated or Both (Identified by Element Shown) CHROME	NICKEL
Evidence of carcinogenicity to humans:	Sufficient	Limited
Evidence of carcinogenicity to animals:	Sufficient	Sufficient

- Avoid breathing of dust or fume. If the use of this material produces dust or fume, use appropriate ventilation controls, personal protective equipment or both. For additional information refer to the Material Safety Data Sheet (MSDS) for this product.

NOTICE: SECTION 313
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ALLOY AA Number	UNS No.	CONSTITUENT(S) % Maximum unless otherwise shown. Mg	Mn	Cr	Cu	Al	Other	DENSITY lbs/cu in	(approx.) MELTING PT. degree (F)
1100	A91100				0.12	99.00 min		.098	1215
3003	A93003		1.2		0.12	98.6 min.		.099	1210
5005	A95005	0.8				99.2 min.		.097	1205
5052	A95052	2.5		0.25		97.2 min.		.097	1200
CAS Number		1309-48-4	7439-96-5	7740-47-3	7440-50-8	7429-90-5			
Contaminant & Exposure Limits		As Fume MgO	As Dust As Fume	As Soluble Salts As Insoluble Salts	As Dust As Fume	As Dust As Fume			
(mg/m3) PEL TLV		15 10	5(c) 5(c) 5(c) 1	0.5 0.5(VI) 1 0.5	1 1 0.1 0.2	0 10 0 5			

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MATERIAL SAFETY DATA SHEET

PLANT JERSEY CITY, N.J.
CABLE NANTAHALA, NEW YORK

Note Our New Address
[redacted]
25 ANN ST., NEW YORK, N.Y. 10038
TELEX: 420803 (CBCC UI)
TELEPHONE: [redacted]
• TELEX: 420803

6/89 MSL

8/7/86

SECTION 1. PRODUCT IDENTIFICATION

Product Name .....
Trade Name ..... [redacted]
Chemical Family .....non-metalic hydrated magnesium silicate minera
Formula ..... SiO_2 56%, MgO, 42%
Cas no. 14807-96-6

SECTION 11. HAZARDOUS INGREDIENTS

Preservatives & Solvents	none
Other liquids, solids, or gases	none

SECTION 111 PHYSICAL DATA

Percent, Volatile	none
Solubility in water.....	none
Vapor pressure	not applicable
Specific gravity	2.6
Appearance	white or off white fine powder
Odor	none

SECTION 1V FIRE AND EXPLOSION HAZARD DATA

Flash point	none
Extinguishing media	will not burn
HMIS rating	0

SECTION V REACTIVITY DATA

Stability	stable at all temperatures
Incompatability	none
Decomposition products...	none
Hazardous polymerization.	none
HMIS rating	0

 (Continued on reverse side)

TRW-02551

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SECTION Vl HEALTH HAZARD DATA

OSHA Exposure limits - 20 Mppcf (Silicates, Talc, non-asbestos-form)
Effects of overexposure
short term ..... minor irratation to lungs & eyes
long term ..... potential for talcosis, lung disease

TOXICITY DATA
Oral LD Rat ..... greater than 5000 mg/kg
Dermal LD Rabbit ..... greater than 5000 mg/kg
Inhalation LD Rat ..... greater than 10000 ppm
Skin irritation ..... none
Eye irritation ..... slightly irratating immediately reversible
FIRST AID and EMERGENCY PROCEDURES
wash and/or flush with water
ACUTE HMIS rating 1

CHRONIC EFFECTS INFORMATION DO NOT breath dust for prolonged periods

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SECTION Vll SPILL, LEAK, AND DISPOSAL

Spills and Leaks ..... sweep with broom, reclaim if possible
Disposal ..... any land fill or dump

SECTION Vlll SPECIAL PROTECTION

Respiratory ..... may wear filter mask or respirator
Ventilation ..... work on well ventilated area
Protective gloves ..... not needed
Eye protection ..... may wear goggles
Other protections ..... none

SECTION lX SPECIAL PRECAUTIONS

NONE NEEDED

TRW-02552

CAS No. 14807-96-6

MATERIAL SAFETY DATA SHEET

Product/Material	Talc
Manufacturer/Distributor	Whittaker, Clark & Daniels, Inc.
Address	1000 Coolidge Street South Plainfield, NJ 07080
Emergency Telephone No.	(201) 561-6100

Section I - Product Identification

Trade Name	Talc
Synonym	Soapstone
Chemical Family	Mangesium Silicate Hydrate
Formula	3MgO:4SiO2:H2O
CAS Number	14807-96-6
HMIS	Health 0 Flammability 0 Reactivity 0

Section II - Hazardous Ingredients

None

Section III - Physical Data

Boiling Point (°F)	Not Applicable
Vapor Pressure (mmHg)	Not Applicable
Vapor Density	Not Applicable
Solubility in Water	Insoluble
Specific Gravity	2.5 - 2.8
Percent Volatile by Weight	0
Evaporation Rate	0
Appearance and Odor	White to off-white powder, Odorless.

Section IV - Fire and Explosion Hazard Data

Flash Point	Non-flammable
Flammable Limits	LEL - Non-flammable UEL - Non-flammable
Extinguishing Media	Water
Special Fire Fighting Procedures	None
Unusual Fire and Explosion Hazards	None

Section V - Health Hazard Data

Threshold Limit Values	20mppcf (OSHA) 2mg/M3, respirable dust (ACGIH)
Effects of Overexposure	May cause mechanical irritation to eyes and respiratory tract.
Emergency and First Aid	Wash dust from skin with soap and water. Flush out eyes with generous amounts of water for at least 15 minutes. See a physician if irritation persists.

Section VI - Reactivity Data

	Product is stable.
Incompatibility	None
Hazardous Decomposition Products	None
	Hazardous polymerization will not occur.

Section VII - Spill or Leak Procedures

Steps to take in case material is released or spilled	Normal cleanup procedures. Care should be taken to avoid causing dust to become airborne. Vacuum cleaning systems are recommended. Do not flush to sewer.
Waste Disposal Method	Disposal must be made in accordance with federal, state and local regulations.

CAS No. 14807-96-6

Section VIII - Special Protection Information

Eye Protection (use most appropriate)	Safety glasses, goggles, face shield
Skin Protection	Leather or rubber gloves.
Respiratory Protection	Use of dust respirator is recommended when exposure limits may be exceeded.
Ventilation	Local exhaust ventilation to collector or containment recommended to control dust to below exposure limits.

Section IX - Special Precautions

Good industrial hygiene practice requires that employee exposure be maintained below the recommended TLV. This is preferably achieved through the provision of adequate ventilation where necessary. Where dust cannot be controlled in this way, personal respiratory protection should be employed.

Issued: 12/02/85

A Mac

Cyprus Minerals Company

MATERIAL SAFETY DATA SHEET

TALCUM POWDER

HMIS	
Health	1
Flammability	0
Reactivity	0
Personal Protection	E

I. IDENTIFICATION

Product Name: SUPRA

Chemical Name: TALC; HYDROUS MAGNESIUM SILICATE	Chemical Family: SILICATES

Formula: $3MgO \cdot 4SiO_2 \cdot H_2O$

II. INGREDIENTS

Mineral or Chemical Name(s)	Weight %	CAS #
TALC - A NATURAL HYDROUS MAGNESIUM SILICATE MINERAL	.90-99%	14807-96-6
DOLOMITE - A NATURAL MAGNESIUM CALCIUM CARBONATE MINERAL	less than 5%	None
CALCITE - A NATURAL CALCIUM CARBONATE MINERAL	less than 5%	1317-65-3
CHLORITE - A NATURAL HYDROUS MAGNESIUM ALUMINUM SILICATE MINERAL	less than 5%	None
QUARTZ - A NATURAL CRYSTALLINE SILICA MINERAL	less than 1%	14808-60-7

III. PHYSICAL DATA

Boiling Point: NOT APPLICABLE	Freezing Point: NOT APPLICABLE	
- Pressure: NOT APPLICABLE	Vapor Density: NOT APPLICABLE	
Evaporation Rate: NOT APPLICABLE	% Volatile: NOT APPLICABLE	
Specific Gravity (water = 1): 2.7 - 2.8	Solubility in Water: NEGLIGIBLE	pH: 7.5 - 9.5

Appearance and Odor: A WHITE POWDER WITH AN EARTHY ODOR

IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: NOT APPLICABLE	Flammable Limits: NOT APPLICABLE

Extinguishing Media: NOT APPLICABLE

Special Fire Fighting Procedures: NOT APPLICABLE

Unusual Fire and Explosion Hazards: NOT APPLICABLE

V. HEALTH HAZARD DATA

Threshold Limit Value: 2 mg/M³ RESPIRABLE DUST OVER AN 8 HOUR EXPOSURE PERIOD

Possible Effects of a Single Overexposure	
Inhalation	ACUTE ACCIDENTAL EXPOSURE WOULD BE NON-SPECIFIC AND SIMILAR TO THE INHALATION OF ANY DUST. SI SYMPTOMS MIGHT INCLUDE COUGHING, WHEEZING, DIFFICULT BREATHING AND UPPER RESPIRATORY TRACT IRRITATION.
Skin Contact	NO ADVERSE EFFECTS ARE KNOWN AS A CONSEQUENCE OF APPLICATION TO UNBROKEN SKIN.
Eye Contact	AS WITH ANY PARTICULATE MATERIAL, TALC CAN CAUSE TEMPORARY DISCOMFORT AND IRRITATION IF ACCIDENTALLY INTRODUCED INTO THE EYE.
Ingestion	NO KNOWN HAZARD.

Cyprus Industrial Minerals Company/Talc Division
Box 3419, Englewood, CO 80155/(303) 740-5440

54-1003T (Rev. 10-85)

CYPRUS

TRW-02556

0908-3938

Possible Effects of Repeated Overexposure
THERE ARE REPORTS THAT A RELATIVELY MILD PNEUMONOCONIOSIS CAN DEVELOP OVER 10-40 YEARS OF OCCUPATIONAL EXPOSURE TO MIXED DUSTS CONTAINING TALC. THE PULMONARY DISEASE WHICH DEVELOPS AFTER SUCH PROLONGED EXPOSURE MAY EXIST WITH OR WITHOUT IMPAIRMENT IN LUNG FUNCTION. PROLONGED INHALATION MAY PROVOKE A FIBROTIC RESPONSE SIMPLY BECAUSE OF THE INSOLUBLE NATURE OF THE MINERAL TALC.

rgency and First Aid Procedures	
Inhalation	REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, GIVE OXYGEN AND CALL A PHYSICIAN.
Skin Contact	OF NO GENERAL CONCERN. BROKEN SKIN CAN BE CLEANSED WITH SOAP AND WATER.
Eye Contact	FOR ACUTE EXPOSURE, FLUSH WITH WATER. IF IRRITATION OR DISCOMFORT PERSISTS, CALL A PHYSICIAN.
Ingestion	NO TREATMENT NECESSARY.

Notes to Physician
THERE ARE NO SPECIFIC ANTIDOTES TO ACUTE OVEREXPOSURE. TREATMENT SHOULD BE DIRECTED AT THE CONTROL OF THE SYMPTOMS AND THE CLINICAL CONDITION. INDIVIDUALS WITH ACTIVE PULMONARY DISEASE SHOULD NOT BE ASSIGNED TO A HEAVY TALC DUST ENVIRONMENT.

VI. REACTIVITY DATA

Stability: TALC IS STABILE AND INERT	Incompatibility: NONE

Hazardous Decomposition Products: NONE

Hazardous Polymerization: NONE

Conditions to Avoid: NONE

VII. SPILL OR LEAK PROCEDURES

Steps to be Taken if Material is Released or Spilled	VACUUM CLEAN OR WET SWEEP SPILLAGE
Waste Disposal Method	WASTE SHOULD BE DISPOSED OF IN CLOSED CONTAINERS TO PREVENT DUST

VIII. SPECIAL PROTECTION INFORMATION

Respiratory Protection	NIOSH APPROVED DUST RESPIRATORS FOR EXPOSURE TO POTENTIALLY HIGH TALC DUST ENVIRONMENT.		
Ventilation	LOCAL EXHAUST VENTILATION RECOMMENDED		
Protective Gloves	NOT REQUIRED	Eye Protection	SAFETY GLASSES
Other Protective Equipment	NOT REQUIRED		

IX. SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storage

- AS WITH ALL POWDERS, LIMIT THE CREATION AND INHALATION OF DUST
- WET FLOORS MAY BECOME EXTREMELY SLIPPERY WHEN TALC IS PRESENT

X. ADDITIONAL INFORMATION

EMERGENCY TELEPHONE NUMBERS

Medical: (303) 740-5440

Technical: (303) 740-5700

FEDERAL HAZARD CLASSIFICATION NUMBERS

- DOT Hazard Classification - Talc not listed.
- RCRA Hazardous Waste No. - Talc not listed
- CERCLA (Superfund) Reportable Quantity - Talc not listed

Dept 231

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
VERMONT TALC	802-875-2136
ADDRESS (Number, Street, City, State, and ZIP Code) P. O. Box 117, Chester, VT 05143	
CHEMICAL NAME AND SYNONYMS Talc	TRADE NAME AND SYNONYMS Vertal 15
CHEMICAL FAMILY Hydrous Magnesium Silicate	FORMULA $Mg_3Si_4O_{10}(OH)_2$

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS		N/A	BASE METAL		N/A
CATALYST		N/A	ALLOYS		N/A
VEHICLE		N/A	METALLIC COATINGS		N/A
SOLVENTS		N/A	FILLER METAL PLUS COATING OR CORE FLUX		N/A
ADDITIVES		N/A	OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
Non-toxic material		Does
		not
		apply

SECTION III - PHYSICAL DATA

BOILING POINT (°F.) Does not apply		SPECIFIC GRAVITY (H_2O=1)	2.8
VAPOR PRESSURE (mm Hg) Does not apply		PERCENT, VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1) Does not apply		EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER Insoluble			
APPEARANCE AND ODOR White powder - Odorless			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS N/A	Lel	Uel
EXTINGUISHING MEDIA Does not apply			
SPECIAL FIRE FIGHTING PROCEDURES Does not apply			
UNUSUAL FIRE AND EXPLOSION HAZARDS			

TRW-02558

(Continued on reverse side)

0908-3940

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	20 MPPCF of airborne contaminants
EFFECTS OF OVEREXPOSURE	None

EMERGENCY AND FIRST AID PROCEDURES

Skin Contact: Remove dust with cold water.

Eyes: Flush with water or eyewash product in eyewash cup.

SECTION VI - PEACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Non-hazardous material, sweep into container

WASTE DISPOSAL METHOD

Handle as any nuisance dust. No special requirements for disposal.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)* Suggest any acceptable dust mask.

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL *(General)*	OTHER Normal air circulator.

PROTECTIVE GLOVES If desired	EYE PROTECTION Safety glasses recommended.

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Decomposition at 1800°C

OTHER PRECAUTIONS

No special precautions - Non-toxic material.

Castrol TLC-925

H.D. Cutting Oil

TLC-925 is one of the most highly compounded cutting oils in the Castrol line. It contains special additives providing active sulfur, chlorine and fat thereby enabling TLC-925 to handle the toughest metals, particularly those involving threading and tapping operations.

Castrol TLC-925 may be used as received or as a concentrate for blending cutting oils used in less severe operations.

Advantages

- Contains anti-mist additive to enhance work place safety.
- Exhibits marked improvements with respect to tool life and finish.
- Helps eliminate inventory problems.
- Handles toughest materials and operations.

Typical Test Data

Specific Gravity @ 60°F	0.900
SSU @ 100°F	160
Pour Point	5°F
Lbs. per gallon	7.5
Appearance	Dark brown fluid
Flash Point	>300°F
Copper Corrosion	Positive

These are typical figures and do not constitute a specification.

Burmah-Castrol Inc.

RARITAN PLAZA II, RARITAN CENTER, EDISON, N.J. 08837 Telex: 219894 (CASED UR)

Telephone: (201) 225-6392 Telecopier: (201) 225-1069

December 11, 1986

T R W Control & Fasteners Group
265 3rd Street
Cambridge, MA 02142

Attn: Mr. Vincent Juliana

Dear Mr. Vincent:

At the request of our sales engineer, Mr. John McCormack, we are happy to provide you with technical data and material safety data sheets on CASTROL TLC-925.

Also, please be advised that we have arranged to ship you, under separate cover, a five-gallon sample of CASTROL TLC-925 for trial purposes at no charge.

Thank you for your interest in CASTROL products. We trust the enclosed information is of assistance, however, should you require any further information or help, please do not hesitate to contact either Mr. McCormack or myself.

Cordially,
BURMAH-CASTROL INC.

Robert P. Phelan/cb.

Robert P. Phelan
Manager/Metalworking Products Div.

RPP/gg
Encls.

cc: Mr. John McCormack
Mr. Dennis Borsuk

CASTROL
MATERIAL SAFETY DATA SHEET

SECTION 1-IDENTITY

BURMAH-CASTROL INC.
RARITAN PLAZA II, RARITAN CENTER
EDISON, NEW JERSEY -08837-

Emergency
Telephone No. 201-225-6392

Name of Person
Responsible for Preparation: MICHAEL P. SHEEHAN Date:11/11/85

Trade Name: CASTROL TLC-925 Chemical Name: NA
Chemical Family: NEAT METALWORKING OIL

SECTION 2-HAZARDOUS INGREDIENTS

Principal Hazardous Component(s)

Chemical & Common Names	%	TLV(Units)	CAS#
NONE			

SECTION 3-PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point(F) NA
Specific Gravity(H2O=1) 0.90

Vapor Pressure(mm Hg) NA @25 DEG C
Percent Volatile by Volume(%) NA

Vapor Density(AIR=1) NA
Evaporation Rate NA
N-BUTYL ACETATE = 1

Solubility in Water INSOLUBLE

Appearance and Odor

SECTION 4-FIRE and EXPLOSION DATA

Flash Point (Method Used)	Flammable Limits in Air %Vol.	Lower	Upper
COC 320 DEG F		NA	NA

Extinguishing Media FOAM, CARBON DIOXIDE AND DRY CHEMICAL.

Special Fire Fighting Procedures USE SELF CONTAINED BREATHING APPARATUS IN ENCLOSED FIRE AREAS.

Unusual Fire and Explosion Hazards NA

APPROVED
JAN 08 1987
ENVIRONMENTAL ENGINEERING

CASTROL
MATERIAL SAFETY DATA SHEET

SECTION 5-PHYSICAL HAZARDS

Stability (Stable/Unstable) STABLE	Conditions to avoid	NA

Incompatibility (Materials to Avoid) AVIOD STRONG OXIDANTS.

Hazardous Decomposition Products: CARBON MONOXIDE, SMOKE, HCL AND OXIDES OF SULFUR.

Hazardous Polymerization (Will/Will Not Occur): WILL NOT OCCUR

Conditions to Avoid: NA

SECTION 6-HEALTH HAZARDS

Threshold Limit Value: NA

Signs and Symptoms of Exposure

Acute Overexposure: PROLONGED SKIN EXPOSURE MAY CAUSE MILD SKIN IRRITATION.

Chronic Overexposure: SAME AS ABOVE.

Emergency First Aid Procedures

1. Inhalation: REMOVE FROM AREA OF VAPORS TO FRESH AIR ENVIRONMENT.
2. Eyes: FLUSH EYES WITH CLEAR WATER UNTIL IRRITATION SUBSIDES, CONTACT A PHYSICIAN.
3. Skin: REMOVE ANY CONTAMINATED CLOTHING, WASH SKIN WITH SOAP AND WATER.
4. Ingestion: DO NOT INDUCE VOMITING, CONTACT A PHYSICIAN.

SECTION 7-SPECIAL PROTECTION INFORMATION

Respiratory Protection (specify type): USE HYDROCARBON VAPOR CANISTER OR AIR SUPPLIED RESPIRATORY PROTECTION IN CONFINED AREAS.

Ventilation	Local Exhaust FACE VELOCITY) 60 FPM	Special	USE ONLY WITH ADEQUATE VENTILATION.
	Mechanical(General) USE EXPLOSION PROOF EQUIPMENT.	Other	NO SMOKING OR OPEN FLAMES.
Protective Gloves	USE CHEMICALLY RESISTANT GLOVES, IF NEEDED TO AVIOD PROLONGED SKIN CONTACT.	Eye Protection	USE SPLASH GOGGLES.

Other Protective Clothing or Equipment: USE CHEMICAL RESISTANT APRON OR OTHER CLOTHING IF NEEDED TO AVIOD REPEATED OR PROLONGED SKIN CONTACT.

CASTROL
MATERIAL SAFETY DATA SHEET

SECTION 8—SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken in Handling and Storage	KEEP CONTAINERS CLOSED WHEN NOT IN USE. DO NOT HANDLE OR STORE NEAR HEAT, SPARKS, FLAME OR STRONG OXIDANTS. ADEQUATE VENTILATION REQUIRED.
Other Precautions	AVIOD BREATHING VAPORS. AVIOD PROLONGED OR REPEATED CONTACT WITH SKIN.
Steps to be Taken in Case Material is Released or Spilled	RECOVER FREE LIQUID. ADD ABSOBANT (SAND, EARTH, SAWDUST, ETC.) TO SPILL AREA AVIOD BREATHING VAPORS. VENTILATE CONFINED SPACES. KEEP PETROLEUM PRODUCTS OUT OF SEWERS AND WATERCOURSES BY DIKING OR IMPOUNDING. ADVISE AUTHORITIES IF PRODUCT HAS ENTERED OR MAY ENTER SEWERS, WATERCOURSES, OR EXTENSIVE LAND AREAS.
Waste disposal method	ASSURE CONFORMITY WITH APPLICABLE REGULATIONS

DISCLAIMER

The information contained herein is beleived to be accurate and is offered in good faith. Because product use is beyond our control, no warranty is given, expressed or implied. Burmah-Castrol Inc. cannot assume any liability for the use of information contained herein.

"This product contains a chlorinated paraffin."

CHLORINATED PARAFFINS ARE A CLASS OF COMPOUNDS THAT ARE SIMILARLY MANUFACTURED BUT VARY IN MOLECULAR STRUCTURE BY CARBON CHAIN LENGTH AND THE DEGREE OF CHLORINATION. THIS PARTICULAR PRODUCT HAS NOT BEEN SHOWN TO HAVE ADVERSE HEALTH EFFECTS. HOWEVER THE CHLORINATED PARAFFINS C12/60 PERCENT CHLORINE AND C24/40 PERCENT CHLORINE IN RECENT NATIONAL TOXICOLOGY PROGRAM BIOASSAYS CAUSE TUMORS IN LABORATORY ANIMALS TO WHICH THOSE CHEMICALS WERE FED AT HIGH DOSES IN COMBINATION WITH CORN OIL. IN ANOTHER STUDY C14 TO 17 52 PERCENT CHLORINATED PARAFFIN WHEN FED TO PREGNANT RATS RESULTED IN DEATH OF OFFSPRING SOON AFTER BIRTH. THE RELEVANCE OF THESE STUDIES IF ANY, HAS NOT BEEN DETERMINED.

MSDS 968-140228
date prepared:
03-03-86

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

HMIS:
Health; 2
Flamm.; 1
Reactivity; 0
Special; ----

DoALL MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

MSDS 968-140228

SECTION I

DISTRIBUTOR'S ~~MANUFACTURER'S~~ NAME	EMERGENCY TELEPHONE NO.
DoALL Company	(312)824-1122
ADDRESS (Number, Street, City, State, and ZIP Code): 254 N. Laurel Ave., Des Plaines, IL 60016	
CHEMICAL NAME AND SYNONYMS: DOT: Nonhazardous, NO label	TRADE NAME AND SYNONYMS: Tapping Cream
CHEMICAL FAMILY: Inverted petroleum emulsion	FORMULA: NA

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

NA NA

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	CAS No.	%	TLV (Units)
Butyl Cellosolve, 2-Butoxyethanol	111-76-2	2	25ppm
No component is listed as a carcinogen on recognized lists.			
Pre-existing eye and skin disorders may be aggravated by exposure to product.			

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	212	SPECIFIC GRAVITY (H_2O=1)	less than 1
VAPOR PRESSURE (mm Hg.)	ND	PERCENT, VOLATILE BY VOLUME (%) as water	65
VAPOR DENSITY (AIR=1)	ND	EVAPORATION RATE (H_2O =1)	1
SOLUBILITY IN WATER	appreciable		
APPEARANCE AND ODOR	Viscous white invert emulsion, slight pet. oil odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
NA - water in composition	NA	NA	NA

EXTINGUISHING MEDIA: CO_2, Dry chemical, Foam

SPECIAL FIRE FIGHTING PROCEDURES: Keep containers cool. Product will not burn unless all water is evaporated. Then Fl. Pt. above 300 F.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Dehydrated product will float on water. Oxides of carbon and hydrogen chloride may be formed during combustion.

(Continued on reverse side)

TRW-02565

0908-3947

Tapping Cream

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: see SECTION II

EFFECTS OF OVEREXPOSURE:
May cause eye and skin irritation. Swallow: G.I. irritation possible.

Breath: NA

EMERGENCY AND FIRST AID PROCEDURES:
Eyes:Flush with water.Skin:Wash with mild soap and warm water.

If swallowed:Get medical attention.

Routes of Entry:Eyes, Skin, ingestion.

SECTION VI - REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	NA

INCOMPATABILITY *(Materials to avoid)*
Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS
Oxides of carbon and hydrogen chloride

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	NA

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Large spills;Scoop into liquid tight container. Follow with action for small spills. Keep product out of sewers,waterways,etc.

Small spills:Mop up and wash with soap and hot water.

WASTE DISPOSAL METHOD:
Treat as oily waste. Do not discard into sewers, waterways, or onto soil.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*: NA

VENTILATION		
NA	LOCAL EXHAUST: NA	SPECIAL: NA
	MECHANICAL *(General)*: NA	OTHER: NA

PROTECTIVE GLOVES: NA

EYE PROTECTION: NA

OTHER PROTECTIVE EQUIPMENT: NA

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
Avoid extreme temperatures in storage area. Keep between 40&120 F

OTHER PRECAUTIONS:
Use reasonable personal hygiene practices.

Launder product-soaked clothes before rewearing.

 Submitted for DoALL COMPANY by R. R. Rogers, Product Manager, Chemical Products R. R. Rogers

Form OSHA-20
Rev. May 72

TRW-02566

0908-3948

BOWMAN DISTRIBUTION
MATERIAL SAFETY DATA SHEET

SECTION I

PRODUCT NAME **TEFLON® SEALANT TAPE**	BOWMAN PART NO. **21463, 21464** **(page 1 of 2)**
SUPPLIER **Bowman Distribution, Barnes Group Inc.**	EMERGENCY TELEPHONE NO. **(216) 391-7200**
ADDRESS **850 East 72nd Street, Cleveland, OH 44103**	DATE **1/15/88**
HAZARDOUS MATERIAL DESCRIPTION, PROPER SHIPPING NAME, HAZARD CLASS, HAZARD ID NO. (49 CFR 172.101)	
ADDITIONAL HAZARD CLASSES (as applicable)	
CHEMICAL FAMILY **Flurocarbon**	FORMULA **Carbon - fluorine**

SECTION II - HAZARDOUS INGREDIENTS

CAS REGISTRY NO.	%W	%V	CHEMICAL NAME(S)	Listed as a Carcinogen in NTP, IARC or OSHA 1910(z) (specify)
			Chemical name and synonyms: Polytetrafluorethylene	
			Material gasses off at 610° F — sblates — leaving fluorine gas	

SECTION III - PHYSICAL DATA

BOILING POINT **None** ____°F ____°C		SPECIFIC GRAVITY (H_2O = 1)	**2.0**		
VAPOR PRESSURE **None** @ ____°F ____°C ☐ mm Hg ☐ psi		PERCENT VOLATILE BY VOLUME (%)	**0**	PERCENT SOLID BY WEIGHT (%)	
VAPOR DENSITY (AIR = 1)	**None**	EVAPORATION RATE (= 1)			
SOLUBILITY IN WATER	**None**	pH =			
APPEARANCE AND ODOR **White color, pungent odor at 610° F.**				MATERIAL IS:	

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT **None** method used ____°F ____°C	FLAMMABLE LIMITS	LEL	UEL
EXTINGUISHING MEDIA **Does not burn.**			
SPECIAL FIRE FIGHTING PROCEDURES **Dry extinguisher — use 0° mask.**			
UNUSUAL FIRE AND EXPLOSION HAZARDS **None**			

Thiokol / Ventron Division
Alfa Products

MATERIAL SAFETY DATA SHEET

Lab Experimental

APPROVED
JAN 26 1987
ENVIRONMENTAL ENGINEERING

PRODUCT NAME: [redacted]

CHEMICAL NATURE: Inorganic non-metallic compound

% ACTIVITY: 99%

I. PHYSICAL DATA

BOILING POINT, 760 mm. Hg	380°C	FREEZE POINT	224°C
SPECIFIC GRAVITY	3.26^{18}	VAPOR PRESSURE AT 233°C	10 mm Hg
VAPOR DENSITY	No data	SOLUBILITY IN H_2O	Soluble with decomposition
PER CENT VOLATILES BY WEIGHT	Not pertinent	IONIC NATURE	No
APPEARANCE AND ODOR	White to yellow crystals - acrid odor.		

II. HAZARDOUS INGREDIENTS

MATERIAL	%	TLV (Units)
Tellurium chloride	99%	Te and compounds 0.1 mg/m^3

III. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (test method)	Not pertinent	AUTOIGNITION TEMPERATURE		No data	
FLAMMABLE LIMITS IN AIR, % by volume	No data	LOWER	----	UPPER	----

EXTINGUISHING MEDIA	Dry chemical extinguishing agents, dry sand. If fire is massive, then use water spray or fog.
SPECIAL FIRE FIGHTING PROCEDURES	If without risk, remove from fire scene. Wear NIOSH/MSHA approved self-contained breathing apparatus and protective clothing.
UNUSUAL FIRE AND EXPLOSION HAZARDS	Material will evolve toxic vapors of HCl if heated to decomposition or if in contact with moisture.

Thiokol / Ventron Division
Alfa Products, 152 Andover Street, Danvers, Massachusetts 01923
(617) 777-1970, (415) 836-1777 Telex: 94-0378 ALFA DARS

#75102

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	Te compounds 0.1 mg/m^3
EFFECTS OF OVEREXPOSURE	Irritation of eyes, skin and respiratory tract. Possible garlic odor to breath and perspiration.
EMERGENCY AND FIRST AID PROCEDURES	Remove from exposure. Eyes: Flush with large volumes of water for at least 15 min. Skin: Brush off, rinse affected area with water, then wash thoroughly with soap and water. Ingestion/Inhalation: Consult a physician as soon as possible.

V. REACTIVITY DATA

STABILITY			
UNSTABLE	STABLE	CONDITIONS TO AVOID	Exposure to moist air (material is hygroscopic).
	X		

INCOMPATIBILITY (materials to avoid)	Water, bases, alkali and alkaline earth metals
HAZARDOUS DECOMPOSITION PRODUCTS	Hydrochloric acid and its vapors.

HAZARDOUS POLYMERIZATION			
May Occur	Will not Occur	CONDITIONS TO AVOID	----------
	X		

VI. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED	Wearing protective equipment (See Sect. VII) cover with dry sand or ground limestone, mix well, transfer to a glass or plastic container, close tightly, and retain for proper disposal. Wash spill area with strong soap and water.
WASTE DISPOSAL METHOD	In accordance with local, state, and federal regulations for the disposal of water reactive chemicals.

VII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)		NIOSH/MSHA approved chemical cartridge respirator for acid gases or self-contained breathing apparatus.		
VENTILATION	LOCAL EXHAUST	Barely acceptable	SPECIAL :	Preferred - Glove box or bag
	MECHANICAL	Not acceptable		with dry atmosphere.
PROTECTIVE GLOVES		Rubber	EYE PROTECTION	Face shield and/or safety goggles & safety glasses.
OTHER PROTECTIVE EQUIPMENT		Laboratory coat and rubber or plastic apron.		

VIII. SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING	WARNING! AVOID CONTACT WITH SKIN AND EYES. DO NOT SWALLOW. DO NOT INHALE VAPORS OF THIS MATERIAL. WASH THOROUGHLY AFTER HANDLING. KEEP CONTAINER TIGHTLY CLOSE WHEN NOT IN USE.
OTHER HANDLING AND STORAGE CONDITIONS	Protect container from physical damage. Store in a cool, dry, well ventilated area, away from bases and reactive metals.

TEMPERING A PINK W/PETRO AG

SECTION I - IDENTIFICATION

EMERGENCY DIRECTORY
413-543-3381 (EASTERN TIME) 8:00AM-5:00PM
800-424-9300 (OFFHOURS) CHEMTREC

HMIS HEALTH 2
HMIS FLAMMABILITY 0
HMIS REACTIVITY 0
HMIS PROTECTION X

HEATBATH CORPORATION 413-543-3381
107 FRONT STREET
INDIAN ORCHARD, MASS. 01151

PREPARED BY: THOMAS A. NADEAU
DATE: 10/6/89

PRODUCT NAME..... TEMPERING A PINK W/PETRO AG
DESCRIPTION..... Heat treating salt.
DOT CLASS:SODIUM NITRITE MIXTURE (SODIUM NITRATE, SODIUM NITRITE AND POTASSIUM NITRATE) OXIDIZER NA 1487 RQ

SECTION II - HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENT	CAS NUMBER	PEL(MG/M3)	TLV(MG/M3)	%
POTASSIUM NITRATE	7757-79-1	N.E.	N.E.	40-50
SODIUM NITRATE	7631-99-4	N.E.	N.E.	1-10
SODIUM NITRITE	7632-00-0	N.E.	N.E.	40-50

N.E.=NOT ESTABLISHED N.A.=NOT APPLICABLE

SECTION III - PHYSICAL DATA

BOILING Point(F)..... decomposes SPECIFIC GRAVITY (H20-1).... 2.15
VAPOR PRESSURE (mm Hg).....N.A. MELTING POINT..... 280 F
VAPOR DENSITY (Air=1)..... N.A. EVAPORATION RATE.....N.A.
SOLUBILITY IN H20..... complete. PH.....N.A.
APPEARANCE/ODOR.....odorless, pink powder.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT..... None. FLAMMABLE LIMITS.....None.
LOWER FLAME LIMIT..... N.A. HIGHER FLAME LIMIT..... N.A.
IN CASE OF FIRE: Use flooding amounts of water.
SPECIAL FIREFIGHTING PROCEDURES: If salt is molten, use dry sand. Wear protective clothing with self-contained breathing apparatus.
UNUSUAL FIRE HAZARDS: Decomposes rapidly when heated over 1100 F. Oxidizer-increases the flammability of organics, combustibles and easily oxidizable materials. Contact of hot salt with combustibles may cause fire. Hazardous fumes may be released under thermal decomposition.

SECTION V - REACTIVITY DATA

CHEMICAL STABILITY: STABLE . CONDITIONS TO AVOID: temperatures >1100 F
INCOMPATIBLE MATERIALS: ammonium salts, cyanides, reducing agents, strong acids. combustibles.
DECOMPOSITION PRODUCTS: oxides of nitrogen under thermal decomposition.
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION VI - HEALTH HAZARD DATA

ROUTES OF ENTRY: Inhalation, ingestion.

MATERIAL SAFETY DATA SHEET
TEMPERING A PINK W/PETRO AG

HEALTH HAZARDS (ACUTE,CHRONIC): Contains OXIDIZER. Contact with other material may cause fire. May cause eye, skin and respiratory tract irritation. May be harmful or fatal if swallowed. Avoid contact with eyes, skin or clothing. Avoid breathing dust.

CARCINOGENICITY: None. NTP?: No. IARC?: No. OSHA REGULATED?: No.

SYMPTOMS OF EXPOSURE: eye, skin and respiratory tract irritation. If ingested, may cause nausea, vomiting, cyanosis, headache and loss of consciousness. May react with secondary amines to form nitrosamines a potential carcinogen.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: not known.

FIRST AID: INHALATION: Move victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult,give oxygen. Get medical attention. EYES: Hold eyelids apart and flush with running water for at least 15 minutes. Get medical attention. SKIN: Wash affected area with soap and water. Remove contaminated clothing. If irritation persists, see a physician. INGESTION: If conscious, give plenty of water. Induce vomiting. Get medical attention.

SECTION VII - PRECAUTIONS/PROCEDURES

IN CASE OF SPILL: Sweep up material into a chemical waste container. Flush spill area with water.
WASTE DISPOSAL METHOD: Dispose in accordance with federal, state and local regulations.
PRECAUTIONS:Use with adequate ventilation. Store in a cool, dry place away from combustibles. Wear proper protective clothing when using this product. Wash thoroughly after handling.

OTHER PRECAUTIONS: Emptied containers of this product may contain hazardous vapors and residue. Clean thoroughly before reusing or discarding. Do not use a welding torch to cut container. Do not use for water or food storage.

SECTION VIII - SPECIAL PROTECTION

RESPIRATORY PROTECTION: Use NIOSH/MSHA approved respirator if dust, fumes or vapors are excessive. VENTILATION: provide good air dilution.
MECHANICAL EXHAUST..... X. PROTECTIVE GLOVES: heat-resistant type.
LOCAL EXHAUST..... X. EYE PROTECTION: face shield.
OTHER PROTECTIVE EQUIPMENT..... apron,boots, full cover work clothes.
WORK/HYGIENIC PRACTICES..... wash thoroughly after handling,launder clothes.

SECT IX -SARA TITLE III INFORMATION

HAZARDOUS COMPONENT	CERCLA RQ LBS.	SECT 302 TPQ LBS.	SECT 313 TOXIC	SECT.311/312 HAZARDS
POTASSIUM NITRATE	N.A.	N.A.	NO	A,C
SODIUM NITRATE	N.A.	N.A.	NO	A,C
SODIUM NITRITE	100	N.A.	NO	A,C

A=IMMEDIATE (ACUTE) HEALTH HAZARD B=DELAYED (CHRONIC) HEALTH HAZARD
C=FIRE HAZARD D=SUDDEN RELEASE OF PRESSURE HAZARD E=REACTIVE HAZAR

EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

DATE ISSUED 4/10/86

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
TERESSTIC 100

PRODUCT CODE
376045 - 01180

CHEMICAL NAME
Petroleum Lubricating Oil

CAS NUMBER
Complex Mixture
CAS Number not applicable

PRODUCT APPEARANCE AND ODOR
Clear liquid, light orange color
Faint petroleum hydrocarbon odor

EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Lubricating Oil Base Stock	64742-54-7 or 64742-65-0	Greater than 99%
Proprietary additives	Mixture	Less than 1%

See Section E for Health and Hazard Information

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	BASIS
1	1	0	Recommended by Exxon

EXPOSURE LIMIT FOR TOTAL PRODUCT	BASIS
5 mg/m3 for oil mist in air	OSHA Regulation 29 CFR 1910.1000

C. EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN CONTACT
In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water.

INHALATION
Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen, if available. If overexposed to oil mist, remove from further exposure until excessive oil mist condition subsides.

INGESTION
If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)
244°C (471°F)
ASTM D 92, Cleveland Open Cup

AUTOIGNITION TEMPERATURE
Greater than 260°C (500°F)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity	BASIS
1	1	0	Recommended by Exxon

HANDLING PRECAUTIONS
Use product with caution around heat, sparks, pilot lights, static electricity, and open flame.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 0.9% Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam or carbon dioxide. Use water to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)
Prolonged or repeated skin contact may cause skin irritation.

NATURE OF HAZARD AND TOXICITY INFORMATION
Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant"

by OSHA criteria.

Product contacting the eyes may cause eye irritation.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
IBP Approximately 377°C (710°F)
by ASTM D 2887

SPECIFIC GRAVITY (15.6 C/15.6 C)
0.88

MOLECULAR WEIGHT
Not determined

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT
-18°C (0°F)
Pour Point by ASTM D 97

VISCOSITY
105 cSt @ 40°C

VAPOR PRESSURE
Less than 0.01 mm Hg @ 20°C

VAPOR DENSITY (AIR = 1)
Greater than 5

PERCENT VOLATILE BY VOLUME
Negligible from open container in 4 hours @ 38°C (100°F)

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F) (n-BUTYL ACETATE = 1)
Less than 0.01

SOLUBILITY IN WATER @ 1 ATM. AND 25 C (77 F)
Negligible; less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

H. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize breathing vapors. Minimize skin contact. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas.
Assure conformity with applicable governmental regulations.

I. PROTECTION AND PRECAUTIONS

VENTILATION
Use local exhaust to capture vapor, mists or fumes, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Use explosion-proof equipment. No smoking or open lights.

RESPIRATORY PROTECTION
Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
Keep containers and storage containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants.

PERSONAL HYGIENE
Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

DOT IDENTIFICATION NUMBER
Not applicable

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use.

The Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by Exxon Company, U.S.A. in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Exxon's interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2737
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:
MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2455
HOUSTON, TX 77252-2180
(713) 656-5949

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MATERIAL SAFETY DATA SHEET

Date of Prep.
5/15/90

For Coatings, Resins and Related Materials

This MSDS Complies with 29 CFR 1910.1200 (The Hazard Communication Standard)

SECTION I

Manufacturer's Name **BEE CHEMICAL COMPANY** SAFETY/ENVIRONMENTAL DEPARTMENT

Street Address 2700 E. 170th STREET City, State and Zip LANSING, ILLINOIS 60438

Emergency Telephone No. (708) 868-7402 Customer Code #:

Product Class **THINNER** Manufacturer's Code Id. T 390
FG01150

Appearance: THINNER VOC - 7.18 lbs/gal

SECTION II - INGREDIENTS

Hazardous Ingredients	Percent By Wt	TLV PPM	PEL PPM	LEL	Vapor Pressure MM HG
TOLUENE * CAS# 108-88-3	100+/-4	100.00	100.00	1.00	24.00

*** This chemical subject to the reporting requirements of Section 313, SARA Title III**

SECTION III - PHYSICAL DATA

Boiling Range 231 - 231 F Vapor Density (X)Heavier ( )Lighter Than Air

Evaporation Rate ( )Faster (X)Slower, Than Ether Percent Volatile by Volume 100+/-4 Weight Per Gallon 7.2

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

DOT Category FLAMMABLE LIQUID Flash Point 45 F TCC LEL* See Section II
DOT Shipping Name: PAINT RELATED MATERIAL

EXTINGUISHING MEDIA Use carbon dioxide or dry chemical extinguishers for small fires. Use foam for large fires.

SPECIAL FIRE FIGHTING PROCEDURE Cool closed containers with water spray.

UNUSUAL FIRE AND EXPLOSION HAZARDS Closed containers may build explosive pressure from heat. Vapors are heavier than air and may travel considerable distances to a source of ignition such as a spark, pilot light, cigarette or unprotected electrical device. Not sensitive to explosion upon mechanical impact.

HAZARDOUS DECOMPOSITION PRODUCTS Carbon dioxide, carbon monoxide, possibly hydrogen chloride.

SECTION V - HEALTH HAZARDS DATA

PERMISSIBLE LIMITS See Section II - Hazardous Ingredients

POTENTIAL EFFECTS OF OVEREXPOSURE

EYE CONTACT
CAN CAUSE EYE IRRITATION FROM VAPORS AND/OR LIQUID CONTACT, OBTAIN MEDICAL ATTENTION IMMEDIATELY

INHALATION
EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL & RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE, POSSIBLE UNCONSCIOUSNESS, & ASPHYXIATION

SKIN CONTACT
REPEATED OR PROLONGED CONTACT CAUSES IRRITATION
REPEATED OR PROLONGED CONTACT MAY CAUSE DEFATTING AND DERMATITIS

INGESTION
CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITTING, AND DIARRHEA
ASPIRATION OF MATERIAL INTO LUNGS MAY CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL

OTHER
ROUTES OF ENTRY: Skin contact, eye contact, inhalation, ingestion.

Toxicity testing on the product has not been conducted. See SECTION XI for further toxicity information on the components of the product.

Manufacturer's Code ID. T 390 FG01150

SECTION VI - EMERGENCY AND FIRST AID PROCEDURES

EYES: Flush immediately with large amounts of water for at least 15 minutes. Obtain immediate medical attention.

SKIN: Wash thoroughly with soap and water. Remove contaminated clothing. CONSULT PHYSICIAN IF IRRITATION PERSISTS

INGESTION: Thoroughly wash mouth with water. Give two glasses of water if conscious. DO NOT INDUCE VOMITING

INHALATION: Remove to fresh air. If breathing has stopped, give artificial respiration. Obtain immediate medical attention.

SECTION VII - REACTIVITY DATA

STABILITY
STABLE

INCOMPATIBILITY (Materials to Avoid)
OXIDIZERS

HAZARDOUS POLYMERIZATION
WILL NOT OCCUR

EXPLOSION HAZARD
VAPORS MAY TRAVEL ALONG GROUND OR BE MOVED BY VENTILATION & IGNITED BY HEAT, PILOT LIGHTS, FLAMES & IGNITION SOURCES AT LOCATIONS DISTANT FROM MATERIAL HANDLING POINT AVOID STATIC CHARGE, GROUND AND BOND EQUIPMENT AGAINST STATIC BUILDUP WHEN POURING, DISPENSING AND MIXING.

CONDITIONS TO AVOID
HIGH TEMPERATURE
IGNITION SOURCES

SECTION VIII - SPILL OR LEAK PROCEDURES

RESPONSE TO SMALL SPILLS: Stop discharge and contain spill. Recover with explosion proof pumping equipment, commercial sorbents, vermiculite or other inert absorbent materials. Place in appropriate container(s) for further handling.
RESPONSE TO LARGE SPILLS: Stop discharge and contain spill or contaminated material using dike, barrier, or other means. Recover with vacuum truck, sorbents or other inert absorbent materials. Place in appropriate container(s) for further handling.
HAZARDS TO BE AVOIDED: Flammable liquid -- avoid sources of ignition. Do not flush to stream, other bodies of water or sewer. Avoid contact with skin or clothing.
Other hazards see Section Nos. IV and V. Eliminate all ignition sources (FLARES, FLAMES including PILOT LIGHTS, ELECTRICAL SPARKS, and STATIC CHARGE BUILDUP). Evacuate area. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Wear appropriate protective equipment. Stop spill at source. Dike area to prevent spreading. Liquid may be taken up on absorbent material and shoveled into containers for disposal. Avoid breathing vapors.
DISPOSAL METHODS: (1) Recycle, if feasible.
(2) Incinerate at authorized facility.
(3) Treatment at Industrial or Liquid waste treatment facility.
(4) Landfill after solidification in a facility authorized to receive waste in accordance with Federal, State, and Local regulations.
NOTE: THIS MATERIAL IF BEING DISCARDED WOULD BE CLASSIFIED A HAZARDOUS IGNITABLE WASTE AND SHOULD BE DISPOSED IN ACCORDANCE WITH LOCAL, STATE, & FEDERAL REGULATIONS.

SECTION IX - SPECIAL PROTECTION INFORMATON

VENTILATION
Air pollution controls may be required. Check local and state regulations.
PROVIDE SUFFICIENT MECHANICAL (GENERAL AND/OR LOCAL EXHAUST) VENTILATION TO MAINTAIN EXPOSURE BELOW PEL TLV(S)

RESPIRATORY PROTECTION
NONE NEEDED IF ADEQUATE VENTILATION IS PROVIDED OTHERWISE A NIOSH APPROVED RESPIRATOR WITH ORGANIC VAPOR CARTRIGES IS RECOMMENDED WITHIN RESPIRATOR TYPE LIMITATIONS.

EYE PROTECTION
USE CHEMICAL GOGGLES

GLOVES
USE CHEMICAL RESISTANT GLOVES

CLOTHES
TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WEAR PROTECTIVE WORK CLOTHES

ADDITIONAL INFORMATION
HAVE EYE WASHES AND SAFETY SHOWERS READILY ACCESSIBLE
WASH CONTAMINATED CLOTHING BEFORE REUSE

SECTION X - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING Keep away from heat, sparks and flame. Use with adquate ventilation. Keep containers closed. Ground and bond equipment against static buildup when pouring, dispensing, and mixing.
OTHER PRECAUTIONS Avoid contact with skin or eyes. Avoid prolonged or repeated breathing of vapors. Do NOT take internally.

Overexposure to components has apparently been found to cause the following effects in laboratory animals:
LIVER ABNORMALITIES
KIDNEY DAMAGE
LUNG DAMAGE
SPLEEN DAMAGE

Overexposure to components has been suggested as a cause of the following effects in humans:
LIVER ABNORMALITIES

Persons with pre-existing skin disorders may be more susceptible to the effects of the product.

The information contained herein is to the best of our knowledge and belief accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the chemical is the sole responsibility of the user. Users of any chemical should satisfy themselve that the conditions and methods of use assure that the chemical is used safely.
NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO THE INFORMATION CONTAINED HEREIN OR THE CHEMICAL TO WHICH THE INFORMATION REFERS
It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Nothing contained herein is to be construed as a recommendation for use in violation of any patents or of applicable laws or regulations.

NFPA Code
Health 2
Flammability 3
Reactivity 0

MATERIAL SAFETY DATA SHEET

PRODUCT CODE: 38

DATE OF PREP. January 12, 1992

Section I

MANUFACTURER: RAFFI & SWANSON, INC.
100 EAMES STREET
WILMINGTON, MA 01887

EMERGENCY TELEPHONE NO.: 617-933-4200

MANUFACTURERS' CODE IDENTIFICATION: Thinner 38

PRODUCT CLASS: Thinner

TRADE NAME: None

THIS PRODUCT IS A MIXTURE CONTAINING ONE OR MORE HAZARDOUS INGREDIENTS.

Section II — HAZARDOUS INGREDIENTS

INGREDIENTS	CAS NUMBER	APPROX. PERCENT BY WEIGHT	TLV PPM	TLV mg/M³	LEL % BY VOL	VAPOR PRESSURE mm of Hg
Toluol †	108-88-3	30	100		1.2	22
Xylol †	1330-20-7	30	100		1.0	5.9
n-Butyl Acetate	123-86-4	25	150		1.7	8
Isobutyl Alcohol	78-83-1	15	50		1.7	8

† Subject to the reporting requirements of EPA Reg. 40 CFR 372 (SARA Title III, Sec. 313).
Mixture does not contain any known or suspect carcinogen according to ACGIH, OSHA, NTP or IARC.

Section III — PHYSICAL DATA

EVAPORATION RATE: ☐ FASTER ☒ SLOWER, THAN ETHER

VAPOR DENSITY: ☒ HEAVIER ☐ LIGHTER, THAN AIR

BOILING RANGE: 212°-290°F

PERCENT VOLATILE BY VOL: 100%

WEIGHT PER GAL: 7.1#

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION:
DOT: Flammable Liquid
OSHA: Flammable Liquid-Class IB

FLASH POINT (closed cup): 40°F lowest flashing component

LEL: 1.0%

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep containers tightly closed. Isolate from heat, sparks and open flame. Do not apply to hot surfaces. Closed containers may explode when exposed to extreme heat.

SPECIAL FIRE FIGHTING PROCEDURES: Water may be ineffective. Water may be used to cool closed containers. Irritating or toxic gases may be pres Use self-contained breathing apparatus.

TRW-02582

Health 2
Flammability 3
Reactivity 0

MATERIAL SAFETY DATA SHEET

PRODUCT CODE: 70

DATE OF PREP. January 11, 1989

Section I

MANUFACTURER: RAFFI & SWANSON, INC
100 EAMES STREET
WILMINGTON, MA 01887

MANUFACTURERS' CODE IDENTIFICATION: Lacquer Thinner 70

EMERGENCY TELEPHONE NO.: 617-933-4200

PRODUCT CLASS: Thinner

TRADE NAME: None

THIS PRODUCT IS A MIXTURE CONTAINING ONE OR MORE HAZARDOUS INGREDIENTS.

Section II — HAZARDOUS INGREDIENTS

INGREDIENTS	CAS NUMBER	APPROX. PERCENT BY WEIGHT	TLV PPM	TLV mg/M³	LEL % BY VOL	VAPOR PRESSURE mm Hg
Toluol †	✓ 108-88-3	60	100		1.2	22
n-Butyl Acetate	123-86-4	15	150		1.7	8
Isopropyl Alcohol	✓ 67-63-0	15	400		2.0	33
Ethyl Acetate	141-78-6	10	400		2.5	74

† Subject to the reporting requirements of EPA Reg. 40 CFR 372 (SARA Title III, Sec. 313).
Mixture does not contain any known or suspect carcinogen according to ACGIH, OSHA, NTP or IARC.

Section III — PHYSICAL DATA

EVAPORATION RATE: ☐ FASTER ☒ SLOWER, THAN ETHER
VAPOR DENSITY: ☒ HEAVIER ☐ LIGHTER, THAN AIR
BOILING RANGE: 171°-260°F
PERCENT VOLATILE BY VOL: 100%
WEIGHT PER GAL: 7.1#

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION:
DOT: Flammable Liquid
OSHA: Flammable Liquid-Class IB

FLASH POINT (closed cup): 24°F lowest flashing component

LEL: 1.2%

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep containers tightly closed. Isolate from heat, sparks and open flame. Do not apply to hot surfaces.
Closed containers may explode when exposed to extreme heat.

SPECIAL FIRE FIGHTING PROCEDURES: Water may be ineffective. Water may be used to cool closed containers. Irritating or toxic gases may be present. Use self-contained breathing apparatus.

0908-3965

TRW-02583

S-F26

PRODUCT CODE 70

Section V — HEALTH HAZARD DATA (Based on data for individual ingredients)

THRESHOLD LIMIT VALUE: See Section II

EFFECTS OF OVEREXPOSURE

CHRONIC TOXICITY: Not known to produce chronic or cumulative effects with exposures within recommended guidelines.

INHALATION: Vapor irritating to eyes, nose, and throat. Can cause headache, dizziness, nausea, weakness, loss of consciousness. Prolonged overexposure may cause permanent injury.

SKIN: Brief contact not expected to be harmful. Prolonged and repeated contact may cause drying of the skin, and absorption of harmful amounts.

EYE CONTACT: Burning and irritation.

INGESTION: Do not take internally. May cause nausea, vomiting, diarrhea and other toxic effects.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Provide fresh air. Give artificial respiration or oxygen if necessary. CALL A PHYSICIAN.

SKIN: Wash thoroughly with soap and water. Remove contaminated clothing and shoes. Wash clothes thoroughly before re-use.

EYE CONTACT: Flush with water for at least 15 minutes. SEE PHYSICIAN.

INGESTION: DO NOT INDUCE VOMITING. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into lungs. CALL A PHYSICIAN.

Section VI — REACTIVITY DATA

STABILITY: ☐ UNSTABLE ☒ STABLE HAZARDOUS POLYMERIZATION: ☐ MAY OCCUR ☒ WILL NOT OCCUR

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion produces carbon monoxide and carbon dioxide. Unidentified organic compounds may be formed.

MATERIALS AND CONDITIONS TO AVOID: Strong acids, strong alkalis, strong oxidizers.

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Avoid breathing vapors. Ventilate area. Remove with inert absorbent and non-sparking tools.

WASTE DISPOSAL METHOD: Incinerate in approved facility. Do not incinerate closed containers. Dispose in accordance with local, state and federal regulations.

Section VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Avoid breathing concentrated vapors or overspray particles if sprayed. In confined or poorly ventilated areas, use NIOSH approved mask with chemical canister or supplied air.

VENTILATION: Provide general mechanical ventilation or local exhaust ventilation sufficient to keep concentration of solvent vapors below 100 PPM

PROTECTIVE GLOVES: Use chemical resistant, impervious gloves for prolonged or repeated contact.

EYE PROTECTION: Safety goggles or face shield where splashes can occur.

OTHER PROTECTIVE EQUIPMENT:

Section IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: ☒ FLAMMABLE ☐ COMBUSTIBLE
Keep in closed containers. Avoid sparks or flame when handling. Can be stored under ambient conditions. Keep closures tight and containers upright to prevent leakage.

OTHER PRECAUTIONS: Avoid prolonged and repeated contact with the skin. Use good personal hygiene practices. Wash hands thoroughly before eating/drinking/smoking/using toilet facilities.

TRW-02584

RECEIVED
JUN - 4 1992

NFPA Code	
Health	2
Flammability	3
Reactivity	0

MATERIAL SAFETY DATA SHEET

PRODUCT CODE: 2866

DATE OF PREP. [redacted]

Section I

MANUFACTURER: RAFFI & SWANSON, INC.
100 EAMES STREET
WILMINGTON, MA 01887

MANUFACTURERS CODE IDENTIFICATION: Synthetic Ena[redacted]2866

EMERGENCY TELEPHONE NO.: 617-933-4200

PRODUCT CLASS: Thinner

TRADE NAME: None

THIS PRODUCT IS A MIXTURE CONTAINING ONE OR MORE HAZARDOUS INGREDIENTS.

Section II — HAZARDOUS INGREDIENTS

INGREDIENTS	CAS NUMBER	APPROX. PERCENT BY WEIGHT	TLV PPM	TLV mg/M³	LEL % BY VOL	VAPOR PRESSURE mm of Hg
Xylol †	1330-20-7	100	100		1.0	5

† Subject to the reporting requirements of EPA Reg. 40 CFR 372 (SARA Title III, Sec. 313).
Mixture does not contain any known or suspect carcinogen according to ACGIH, OSHA, NTP or IARC

Section III — PHYSICAL DATA

EVAPORATION RATE: ☐ FASTER ☑ SLOWER, THAN ETHER
VAPOR DENSITY: ☑ HEAVIER ☐ LIGHTER, THAN A
BOILING RANGE: 281°-291°F PERCENT VOLATILE BY VOL: 100%
WEIGHT PER GAL: 7.2#

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION:*
DOT: Flammable Liquid
OSHA: Flammable Liquid - Class IC

FLASH POINT (closed cup): 81°F
LEL: 1.0%

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep containers tightly closed. Isolate from heat, sparks and open flame. Do not apply to hot surfaces. Closed containers may explode when exposed to extreme heat.

SPECIAL FIRE FIGHTING PROCEDURES: Water may be ineffective. Water may be used to cool closed containers. Irritating or toxic gases may be pre
Use self-contained breathing apparatus.

TRW-02585

PRODUCT CODE: 38

Section V — HEALTH HAZARD DATA (Based on data for individual ingredients)

THRESHOLD LIMIT VALUE - See Section II

EFFECTS OF OVEREXPOSURE

CHRONIC TOXICITY: Not known to produce chronic or cumulative effects with exposures within recommended guidelines.

INHALATION: Vapor irritating to eyes, nose, and throat. Can cause headache, dizziness, nausea, weakness, loss of consciousness. Prolonged overexposure may cause permanent injury.

SKIN: Brief contact not expected to be harmful. Prolonged and repeated contact may cause drying of the skin, and absorption of harmful amounts.

EYE CONTACT: Burning and irritation.

INGESTION: Do not take internally. May cause nausea, vomiting, diarrhea and other toxic effects.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Provide fresh air. Give artificial respiration or oxygen if necessary. CALL A PHYSICIAN.

SKIN: Wash thoroughly with soap and water. Remove contaminated clothing and shoes. Wash clothes thoroughly before re-use.

EYE CONTACT: Flush with water for at least 15 minutes. SEE PHYSICIAN.

INGESTION: DO NOT INDUCE VOMITING. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into lungs. CALL A PHYSICIAN.

Section VI — REACTIVITY DATA

STABILITY: ☐ UNSTABLE ☒ STABLE HAZARDOUS POLYMERIZATION: ☐ MAY OCCUR ☒ WILL NOT OCCUR

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion produces carbon monoxide and carbon dioxide. Unidentified organic compounds may be formed.

MATERIALS AND CONDITIONS TO AVOID: Strong acids, strong alkalis, strong oxidizers.

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Avoid breathing vapors. Ventilate area. Remc with inert absorbent and non-sparking tools.

WASTE DISPOSAL METHOD: Incinerate in approved facility. Do not incinerate closed containers. Dispose in accordance with local, state and federal regulations.

Section VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Avoid breathing concentrated vapors or overspray particles if sprayed. In confined or poorly ventilated areas, use NIOS approved mask with chemical canister or supplied air.

VENTILATION: Provide general mechanical ventilation or local exhaust ventilation sufficient to keep concentration of solvent vapors below 50 PPM

PROTECTIVE GLOVES: Use chemical resistant, impervious gloves for prolonged or repeated contact.

EYE PROTECTION: Safety goggles or face shield where splashes can occur.

OTHER PROTECTIVE EQUIPMENT:

Section IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: ☒ FLAMMABLE ☐ COMBUSTIBLE
Keep in closed containers. Avoid sparks or flame when handling. Can be stored under ambient conditions. Keep closures tight and containers upright tc prevent leakage.

OTHER PRECAUTIONS: Avoid prolonged and repeated contact with the skin. Use good personal hygiene practices. Wash hands thoroughly before eating/drinking/smoking/using toilet facilities.

TRW-02586

PRODUCT CODE: 2866

Section V — HEALTH HAZARD DATA (Based on data for individual ingredients)

THRESHOLD LIMIT VALUE - See Section II

EFFECTS OF OVEREXPOSURE

CHRONIC TOXICITY: Not known to produce chronic or cumulative effects with exposures within recommended guidelines.

INHALATION. Vapor irritating to eyes, nose, and throat. Can cause headache, dizziness, nausea, weakness, loss of consciousness. Prolonged overexposure may cause permanent injury.

SKIN. Brief contact not expected to be harmful. Prolonged and repeated contact may cause drying of the skin, and absorption of harmful amounts.

EYE CONTACT: Burning and irritation.

INGESTION: Do not take internally. May cause nausea, vomiting, diarrhea and other toxic effects.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Provide fresh air. Give artificial respiration or oxygen if necessary. CALL A PHYSICIAN.

SKIN. Wash thoroughly with soap and water. Remove contaminated clothing and shoes. Wash clothes thoroughly before re-use.

EYE CONTACT: Flush with water for at least 15 minutes. SEE PHYSICIAN.

INGESTION: DO NOT INDUCE VOMITING. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into lungs. CALL A PHYSICIAN.

Section VI — REACTIVITY DATA

STABILITY: ☐ UNSTABLE ☒ STABLE HAZARDOUS POLYMERIZATION: ☐ MAY OCCUR ☒ WILL NOT OCCUR

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion produces carbon monoxide and carbon dioxide. Unidentified organic compounds may be formed.

MATERIALS AND CONDITIONS TO AVOID: Strong acids, strong alkalis, strong oxidizers.

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Avoid breathing vapors. Ventilate area. Remove with inert absorbent and non-sparking tools.

WASTE DISPOSAL METHOD: Incinerate in approved facility. Do not incinerate closed containers. Dispose in accordance with local, state and federal regulations.

Section VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION. Avoid breathing concentrated vapors or overspray particles if sprayed. In confined or poorly ventilated areas, use NIOSH approved mask with chemical canister or supplied air.

VENTILATION: Provide general mechanical ventilation or local exhaust ventilation sufficient to keep concentration of solvent vapors below 100 PPM

PROTECTIVE GLOVES: Use chemical resistant, impervious gloves for prolonged or repeated contact.

EYE PROTECTION: Safety goggles or face shield where splashes can occur.

OTHER PROTECTIVE EQUIPMENT:

Section IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: ☒ FLAMMABLE ☐ COMBUSTIBLE
Keep in closed containers. Avoid sparks or flame when handling. Can be stored under ambient conditions. Keep closures tight and containers upright to prevent leakage.

OTHER PRECAUTIONS: Avoid prolonged and repeated contact with the skin. Use good personal hygiene practices. Wash hands thoroughly before eating/drinking/smoking/using toilet facilities.

TRW-02587

0908-3969

717

NFPA Code	
Health	1
Flammability	3
Reactivity	0

MATERIAL SAFETY DATA SHEET

PRODUCT CODE: 6046

DATE OF PREP.: September 15, 1989

Section I

MANUFACTURER: RAFFI & SWANSON, INC.
100 EAMES STREET
WILMINGTON, MA 01887

EMERGENCY TELEPHONE NO.: [redacted]

MANUFACTURERS' CODE IDENTIFICATION: [redacted]

PRODUCT CLASS: Thinner

TRADE NAME: None

THIS PRODUCT IS A MIXTURE CONTAINING ONE OR MORE HAZARDOUS INGREDIENTS

Section II — HAZARDOUS INGREDIENTS

INGREDIENTS	CAS NUMBER	APPROX. PERCENT BY WEIGHT	TLV PPM	TLV mg/M³	LEL % BY VOL	VAPOR PRESSURE mm of Hg
Isobutyl Alcohol	78-83-1	50	50		1.7	8
Ethyl Alcohol	64-17-5	47	1000		4.3	45
Methyl Alcohol-Skin †	67-56-1	3	200		6.0	96

† Subject to the reporting requirements of EPA Reg. 40 CFR 372 (SARA Title III, Sec. 313).
Mixture does not contain any known or suspect carcinogen according to ACGIH, OSHA, NTP or IARC.

Section III — PHYSICAL DATA

EVAPORATION RATE: ☐ FASTER ☒ SLOWER, THAN ETHER
VAPOR DENSITY: ☒ HEAVIER ☐ LIGHTER, THAN AIR
BOILING RANGE: 147°-225°F PERCENT VOLATILE BY VOL: 100%
WEIGHT PER GAL: 6.75#

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION:
DOT: Flammable Liquid
OSHA: Flammable Liquid-Class IB

FLASH POINT (closed cup): 52°F lowest flashing component

LEL: 1.7%

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep containers tightly closed. Isolate from heat, sparks and open flame. Do not apply to hot surfaces. Closed containers may explode when exposed to extreme heat.

SPECIAL FIRE FIGHTING PROCEDURES: Water may be ineffective. Water may be used to cool closed containers. Irritating or toxic gases may be present. Use self-contained breathing apparatus.

TRW-02588

0908-3970

PRODUCT CODE: 6046

Section V — HEALTH HAZARD DATA (Based on data for individual ingredients)

THRESHOLD LIMIT VALUE - See Section II

EFFECTS OF OVEREXPOSURE

CHRONIC TOXICITY: See Section IX.

INHALATION: Vapor irritating to eyes, nose, and throat. Can cause headache, dizziness, nausea, weakness, loss of consciousness. Prolonged overexposure may cause permanent injury.

SKIN: Penetrates skin. Prolonged and repeated contact may cause drying of the skin, and absorption of harmful amounts.

EYE CONTACT: Burning and irritation.

INGESTION: Do not take internally. May cause nausea, vomiting, diarrhea and other toxic effects.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Provide fresh air. Give artificial respiration or oxygen if necessary. CALL A PHYSICIAN.

SKIN: Wash thoroughly with soap and water. Remove contaminated clothing and shoes. Wash clothes thoroughly before re-use.

EYE CONTACT: Flush with water for at least 15 minutes. SEE PHYSICIAN.

INGESTION: If conscious, give several glasses of water and induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into lungs. CALL A PHYSICIAN.

Section VI — REACTIVITY DATA

STABILITY: ☐ UNSTABLE ☒ STABLE HAZARDOUS POLYMERIZATION: ☐ MAY OCCUR ☒ WILL NOT OCCUR

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion produces carbon monoxide and carbon dioxide. Unidentified organic compounds may be formed.

MATERIALS AND CONDITIONS TO AVOID: Strong acids, strong alkalis, strong oxidizers.

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Avoid breathing vapors. Ventilate area. Remove with inert absorbent and non-sparking tools.

WASTE DISPOSAL METHOD: Incinerate in approved facility. Do not incinerate closed containers. Dispose in accordance with local, state and federal regulations.

Section VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Avoid breathing concentrated vapors or overspray particles if sprayed. In confined or poorly ventilated areas, use NIOSH approved mask with chemical canister or supplied air.

VENTILATION: Provide general mechanical ventilation or local exhaust ventilation sufficient to keep concentration of solvent vapors below 50 PPM

PROTECTIVE GLOVES: Use chemical resistant, impervious gloves for contact.

EYE PROTECTION: Safety goggles or face shield where splashes can occur.

OTHER PROTECTIVE EQUIPMENT:

Section IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: ☒ FLAMMABLE ☐ COMBUSTIBLE

Keep in closed containers. Avoid sparks or flame when handling. Can be stored under ambient conditions. Keep closures tight and containers upright to prevent leakage.

OTHER PRECAUTIONS: Avoid contact with the skin. Use good personal hygiene practices. Wash hands thoroughly before eating/drinking/smoking/using toilet facilities.

Repeated overexposure to methanol may injure retina and optic nerve and cause blindness.

Label: Solvent
Flammable

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
Providence Chemical Distributing Corporation	([redacted])
ADDRESS (Number, Street, City, State, and ZIP Code): King Philip Road, East Providence, Rhode Island 02916	
CHEMICAL NAME AND SYNONYMS: 2-Butanone	TRADE NAME AND SYNONYMS: [redacted]
CHEMICAL FAMILY: Ketones	FORMULA: Proprietary

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
2-Butanone (Methyl Ethyl Ketone) CAS# 78-93-3	100	200ppm

SECTION III - PHYSICAL DATA

BOILING POINT (°F.) 760 mm. Hg	79.6°C.	SPECIFIC GRAVITY (H_2O=1)	0.8061 at 20/20°C
VAPOR PRESSURE (mm Hg.) @20°C.	74mm. Hg	PERCENT, VOLATILE BY VOLUME (%)	100
VAPOR DENSITY (AIR=1)	2.5	EVAPORATION RATE (_____ =1)	5.7
SOLUBILITY IN WATER (Vol%)	24		
APPEARANCE AND ODOR: Clear Liquid; Nonresidual Odor			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
24°F., Tag Closed Cup ASTM D56			

EXTINGUISHING MEDIA: Use carbon dioxide or dry chemical for small fires. Use alcohol-type foam or water fog for large fires.

SPECIAL FIRE FIGHTING PROCEDURES: NONE

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

(Continued on reverse side)

SECTION V · HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
200 ppm. ACGIH (1977) OSHA CFR 29 1000 Table G1

EFFECTS OF OVEREXPOSURE
Irritation of nose, throat, and eyes. Headache, nausea, vomiting.

EMERGENCY AND FIRST AID PROCEDURES
Remove to fresh air and call a physician. Flush skin and eye contact with water. If swallowed, induce vomiting and call a physician. If inhaled, remove to fresh air. If not breathing, give artifical respiration. If breathing is difficult, give oxygen. Call Physician. If contact with eyes, flush eyes with plenty of water for at least 15 minutes. Call Physician.

SECTION VI · REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	xx	None

INCOMPATABILITY *(Materials to avoid)*
Avoid alkaline materials, mineral acids, halogents

HAZARDOUS DECOMPOSITION PRODUCTS
Burning can produce carbon monoxide and/or carbon dioxide.

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	xx	None

SECTION VII · SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Eliminate all sources of ignition. Wear suitable protective equipment. Collect for disposal. See Section VIII.

WASTE DISPOSAL METHOD
Incinerate in a furnace where permitted under appropriate Federal, State and Local Regulations. Incineration is the preferred method of disposal. It should also be feasible to treat very dilute solutions in a water treatment plant.

SECTION VIII · SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*
Air-supplied respirator in high concentrations.

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL *(General)* xx	OTHER

PROTECTIVE GLOVES	EYE PROTECTION
Rubber Gloves	Safety Glasses

OTHER PROTECTIVE EQUIPMENT
Safety Shower and Eye Bath.

SECTION IX · SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Harmful if inhaled-flammable-causes eye irritation-Avoid breathing vapor. Avoid contact with eyes. Keep away from heat, sparks and open flame. Keep container closed when not in use.

OTHER PRECAUTIONS
Reports have associated repeated & prolonged occupational over-exposure to solvents with permanent brain & nervous system damage. Intentional misuse by deliberately concentrating & inhaling the contents may be harmful or fatal.

While the information & recommendations set forth herein are believed to be accurate as of the date hereof, Providence Chemicals Div. makes no warranty with respect thereto and disclaims all liability from reliance thereon.

3/31/86

MATERIAL SAFETY DATA SHEET

FOR COATINGS, RESINS AND RELATED MATERIALS

DATE OF PREP.	PRODUCT
3/27/84	9352

Section I

MANUFACTURER'S NAME RAFFI AND SWANSON, INC.

STREET ADDRESS 100 Eames Street — CITY, STATE, AND ZIP CODE Wilmington, Mass. 01887

EMERGENCY TELEPHONE NO. 617-933-4200 — MANUFACTURER'S CODE IDENTIFICATION

PRODUCT CLASS Thinner — 9352 Thinner

TRADE NAME N/A

Information on the composition of Raffi and Swanson, Inc. products is confidential proprietary information and is provided solely to aid in safe handling of these materials. Use or disclosure for any other purpose is expressly forbidden.

Section II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT by volume	TLV PPM	TLV mg/M³	LEL	VAPOR PRESSURE
Butyl Cellosolve	45	25		1.1%	0.6mm Hg.
Toluol	25	100		1.2%	37mm Hg.
Xylol	30	100		0.1%	5.9mm Hg.

Section III — PHYSICAL DATA

BOILING RANGE 232°F. - 340°F. — VAPOR DENSITY [X] HEAVIER [ ] LIGHTER, THAN AIR

EVAPORATION RATE [ ] FASTER [X] SLOWER, THAN ETHER — PERCENT VOLATILE BY VOLUME 100 % — WEIGHT PER GALLON 7.3

Section IV — FIRE AND EXPLOSION HAZARD DATA

DOT CATEGORY Flammable Liquid — FLASH POINT 40°F. lowest flashing component — LEL 1.0%

OSHA FLAMMABILITY CLASSIFICATION Flammable Liquid-Class 1B

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical or Foam.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Keep containers tightly closed. Isolate from heat, sparks and open flame. Do not apply to hot surfaces. Closed containers may explode when exposed to extreme heat.

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective. Water may be used to cool closed containers.

TRW-02592

PRODUCT 9352

Section V — HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE See Section II

EFFECTS OF OVEREXPOSURE

INHALATION: Vapor irritating to eyes, nose, and throat. Can cause headache, dizziness, nausea, weakness, loss of consciousness.

EYE CONTACT: Burning and irritation.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Provide fresh air. Give artificial respiration or oxygen if necessary. Call physician.

EYE CONTACT: Lubricate eye with C. P. Castor Oil or wash with large amounts of water. SEE PHYSICIAN.

Section VI — REACTIVITY DATA

STABILITY ☐ UNSTABLE ☒ STABLE CONDITIONS TO AVOID

INCOMPATABILITY (Materials to avoid)

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION ☐ MAY OCCUR ☒ WILL NOT OCCUR

CONDITIONS TO AVOID

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Avoid breathing vapors. Ventilate area. Remove with inert absorbent and non-sparking tools.

WASTE DISPOSAL METHOD Incinerate in approved facility. Solid residue to sanitary land fill. Dispose in accordance with local, state, and federal regulations. Do not incinerate closed containers.

Section VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION

Avoid breathing concentrated vapors or overspray particles if sprayed. In confined or poorly ventilated areas, use Bureau of Mines approved mask with chemical canister or supplied air.

VENTILATION

Provide general mechanical ventilation or local exhaust ventilation sufficient to keep TLV of vapors below 25 PPM.

PROTECTIVE GLOVES Use for prolonged or repeated contact.

EYE PROTECTION Safety goggles or face shield where splashes can occur.

OTHER PROTECTIVE EQUIPMENT

Section IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

FLAMMABLE. Keep in closed containers. Avoid sparks or flame when handling. Can be stored under ambient conditions.

OTHER PRECAUTIONS

Avoid prolonged contact with the skin.

TRW-02593

720

NFPA Code	
Health	2
Flammability	3
Reactivity	0

MATERIAL SAFETY DATA SHEET

PRODUCT CODE: 9693

DATE OF PREP. January 13, 1989

Section I

MANUFACTURER: RAFFI & SWANSON, INC.
100 EAMES STREET
WILMINGTON, MA 01887

MANUFACTURERS' CODE IDENTIFICATION: [redacted]

EMERGENCY TELEPHONE NO.: [redacted]

PRODUCT CLASS: Thinner

TRADE NAME: None

THIS PRODUCT IS A MIXTURE CONTAINING ONE OR MORE HAZARDOUS INGREDIENTS.

Section II — HAZARDOUS INGREDIENTS

INGREDIENTS	CAS NUMBER	APPROX. PERCENT BY WEIGHT	TLV PPM	TLV mg/M³	LEL % BY VOL	VAPOR PRESSURE mm of Hg
Xylol †	1330-20-7	30	100		1.0	5.9
Toluol †	108-88-3	30	100		1.2	22
n-Butyl Acetate	123-86-4	15	150		1.7	8
Propylene Glycol Methyl Ether (Dowanol PM)	107-98-2	15	100		Not Avail.	8
Isobutyl Acetate	110-19-0	10	150		1.7	12.5

† Subject to the reporting requirements of EPA Reg. 40 CFR 372 (SARA Title III, Sec. 313).
Mixture does not contain any known or suspect carcinogen according to ACGIH, OSHA, NTP or IARC.

Section III — PHYSICAL DATA

EVAPORATION RATE: ☐ FASTER ☒ SLOWER, THAN ETHER
VAPOR DENSITY: ☒ HEAVIER ☐ LIGHTER, THAN AIR
BOILING RANGE: 232°-291°F
PERCENT VOLATILE BY VOL: 100%
WEIGHT PER GAL: 7.26#

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION:
DOT: Flammable Liquid
OSHA: Flammable Liquid-Class IB

FLASH POINT (closed cup): 40°F lowest flashing component

LEL: 1.0%

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep containers tightly closed. Isolate from heat, sparks and open flame. Do not apply to hot surfaces. Closed containers may explode when exposed to extreme heat.

SPECIAL FIRE FIGHTING PROCEDURES: Water may be ineffective. Water may be used to cool closed containers. Irritating or toxic gases may be present. Use self-contained breathing apparatus.

TRW-02594

0908-3976

PRODUCT CODE: 9693

Section V — HEALTH HAZARD DATA (Based on data for individual ingredients)

THRESHOLD LIMIT VALUE - See Section II

EFFECTS OF OVEREXPOSURE

CHRONIC TOXICITY: Not known to produce chronic or cumulative effects with exposures within recommended guidelines.

INHALATION: Vapor irritating to eyes, nose, and throat. Can cause headache, dizziness, nausea, weakness, loss of consciousness. Prolonged overexposure may cause permanent injury.

SKIN: Brief contact not expected to be harmful. Prolonged and repeated contact may cause drying of the skin, and absorption of harmful amounts.

EYE CONTACT: Burning and irritation.

INGESTION: Do not take internally. May cause nausea, vomiting, diarrhea and other toxic effects.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Provide fresh air. Give artificial respiration or oxygen if necessary. CALL A PHYSICIAN.

SKIN: Wash thoroughly with soap and water. Remove contaminated clothing and shoes. Wash clothes thoroughly before re-use.

EYE CONTACT: Flush with water for at least 15 minutes. SEE PHYSICIAN.

INGESTION: DO NOT INDUCE VOMITING. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into lungs. CALL A PHYSICIAN.

Section VI — REACTIVITY DATA

STABILITY: ☐ UNSTABLE ☒ STABLE HAZARDOUS POLYMERIZATION: ☐ MAY OCCUR ☒ WILL NOT OCCUR

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion produces carbon monoxide and carbon dioxide. Unidentified organic compounds may be formed.

MATERIALS AND CONDITIONS TO AVOID: Strong acids, strong alkalis, strong oxidizers.

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Avoid breathing vapors. Ventilate area. Remove with inert absorbent and non-sparking tools.

WASTE DISPOSAL METHOD: Incinerate in approved facility. Do not incinerate closed containers. Dispose in accordance with local, state and federal regulations.

Section VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Avoid breathing concentrated vapors or overspray particles if sprayed. In confined or poorly ventilated areas, use NIOSH approved mask with chemical canister or supplied air.

VENTILATION: Provide general mechanical ventilation or local exhaust ventilation sufficient to keep concentration of solvent vapors below 100 PPM

PROTECTIVE GLOVES: Use chemical resistant, impervious gloves for prolonged or repeated contact.

EYE PROTECTION: Safety goggles or face shield where splashes can occur.

OTHER PROTECTIVE EQUIPMENT:

Section IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: ☒ FLAMMABLE ☐ COMBUSTIBLE

Keep in closed containers. Avoid sparks or flame when handling. Can be stored under ambient conditions. Keep closures tight and containers upright to prevent leakage.

OTHER PRECAUTIONS: Avoid prolonged and repeated contact with the skin. Use good personal hygiene practices. Wash hands thoroughly before eating/drinking/smoking/using toilet facilities.

TRW-02595

Dept. 230

MAN-GILL CHEMICAL COMPANY

23000 ST. CLAIR AVE. • CLEVELAND, OHIO 44117 • 800-328-9745
EMERGENCY 24 HOUR CHEMTREC NO. 800-424-9300

MATERIAL SAFETY DATA SHEET

08794

Section I

Identity
TOLUIDINE RED SHADING BASE

Date Prepared 07/08/87 Date Revised 07/08/87
NFPA CODE:
HEALTH: 3 FLAMMABILITY: 3 REACTIVITY: 1

Section II - Hazardous Ingredients

Hazardous Ingredients	CAS #	Health Hazards	ACGIH TLV-TWA
BUTYL CELLOSOLVE (2-BUTOXYETHANOL)	111-76-2	COMBUSTIBLE STEL - 75 PPM	25 PPM SKIN
FORMALDEHYDE *IARC MONOGRAPHS	50-00-0	*SUSPECT CANCER	1.5 MG/CUM
ISOBUTYL ALCOHOL (ISOBUTANOL)	78-83-1	FLAMMABLE	50 PPM
METHYL AMYL KETONE	110-43-0	COMBUSTIBLE NIOSH - 100 PPM	50 PPM
XYLENE	1330-20-7	FLAMMABLE NIOSH - 100 PPM STEL - 150 PPM	435 MG/CUM
ETHYLBENZENE	100-41-4	STEL - 125 PPM	100 PPM

Section III - Physical/Chemical Characteristics

Boiling Point: 275 - 340 DEG F

Specific Gravity(H20=1): 0.984

Vapor Pressure(mm Hg): NOT DETERMINED

Percent Volatile By Volume (%): 57.3

Vapor Density (AIR=Reference): HEAVIER

Evaporation Rate (Ether=Reference): SLOWER

Water Soluble: NO

Appearance and Odor: RED LIQUID, MILD ODOR

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used): 80 DEG F TCC

Flammable Limits: LOWEST VALUE — LEL: 1.0 — UEL:

Extinguishing Media: CARBON DIOXIDE. DRY CHEMICAL.

Special Fire Fighting Procedures: IF EXPOSED TO HEAT, PRESSURE WILL BUILD UP IN CONTAINER.

Unusual Fire and Explosion Hazards: A STRAIGHT WATER STREAM WOULD SPREAD FIRES. STATIC ELECTRICITY COULD CAUSE IGNITION.

TRW-02596

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EMERGENCY 24 HOUR CHEMTREC NO. 800-424-9300

MATERIAL SAFETY DATA SHEET

Section V - Reactivity Data

STABILITY — Unstable / Stable * — Conditions to Avoid: AVOID PROLONGED STORAGE AT ELEVATED TEMPERATURES.

INCOMPATIBILITY (Materials to Avoid)
STRONG OXIDIZERS

Hazardous Decomposition Products
OXIDES OF CARBON

HAZARDOUS POLYMERIZATION — May Occur / Will Not Occur * — Conditons to Avoid: NONE

Section VI - Health Hazard Data

Effects of Overexposure: IRRITATING TO EYES, NOSE & THROAT. INHALATION MAY CAUSE DIZZINESS, EXCITEMENT, DROWSINESS & STAGGERING GAIT. INGESTION MAY CAUSE NAUSEA, VOMITING & ABDOMINAL PAIN. EXPOSURE TO HIGH LEVELS OF VAPOR MAY CAUSE REVERSIBLE DAMAGE TO KIDNEYS & LIVER, SKIN RASH & REVERSIBLE EYE DAMAGE. MAY CAUSE HEMOLYSIS & HEMOGLOBINURIA. TARGET ORGANS AFFECTED - CNS, EYES, GI TRACT, BLOOD, LIVER, KIDNEYS & SKIN.

Emergency and First Aid Procedures

Eye (Contact): FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR 15 MINUTES AND CONTACT PHYSICIAN IMMEDIATELY.

Skin (Contact): WASH WITH SOAP AND WATER. CONTACT PHYSICIAN IF IRRITATION PERSISTS.

Ingestion (Swallowing): DO NOT INDUCE VOMITING. DRINK LARGE QUANTITIES OF WATER AND/OR MILK. CONSULT PHYSICIAN IMMEDIATELY.

Inhalation (Breathing): REMOVE TO FRESH AIR. AID IN BREATHING IF NECESSARY AND GET IMMEDIATE MEDICAL ATTENTION IF NEEDED.

Section VII - Precautions for Safe Handling & Use

Steps to be taken in Case Material is Released or Spilled
WEAR APPROPRIATE PROTECTIVE EQUIPMENT. REMOVE IGNITION SOURCES. CONTAIN SPILL. ABSORB WITH INERT MATERIAL AND DISPOSE.

Waste Disposal Method: DISPOSE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

Handling and Storage: DO NOT STORE OR USE NEAR HEAT, SPARKS, OR FLAME. DO NOT STORE NEAR COMBUSTIBLE MATERIAL. DO NOT STORE IN DIRECT SUNLIGHT. WHEN SANDING DRY FILM, USE NIOSH APPROVED DUST MASK. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE.

Other Precautions: SHOWERS AND EYE WASH FOUNTAINS SHOULD BE MADE AVAILABLE WHERE CHEMICALS ARE USED.

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EMERGENCY 24 HOUR CHEMTREC NO. 800-424-9300

MATERIAL SAFETY DATA SHEET

Section VIII - Control Measures

Respiratory Protection (Specify Type)
USE NIOSH APPROVED EQUIPMENT WHEN AIRBORNE EXPOSURE LIMITS ARE EXCEEDED.

VENTILATION Local, Mechanical — RECOMMENDED TO MAINTAIN BELOW TLV

Protective Gloves
NEOPRENE RUBBER

Eye Protection
SPLASH GOGGLES OR FACE SHIELD

Other Protective Clothing or Equipment
PROTECTIVE CLOTHING SUFFICIENT TO PREVENT SKIN CONTACT.

Work/Hygienic Practices
WASH THOROUGHLY BEFORE EATING, SMOKING OR USING TOILET FACILITIES.

APPROVED
JUL 1 0 1987
ENVIRONMENTAL ENGINEERING

TRW-02598

MATERIAL SAFETY DATA SHEET
FOR COATINGS, RESINS & RELATED MATERIALS
(APPROVED BY U.S.DEPT. OF LABOR 'ESSENTIALLY SIMILAR' TO FORM OSHA-20)

SECTION 1

MANUFACTURER'S NAME: CADILAC PAINT & VARNISH COMPANY, INC.
STREET ADDRESS: 409 ELIOT STREET ASHLAND, MASS. 01701
EMERGENCY TELEPHONE NUMBER: (617) 881-2926
DATE OF PREPARATION: 10-JUL-84
PRODUCT CLASS: SOLVENT BLENDS
MANUFACTURER'S CODE IDENTIFICATION: T -013
TRADE NAME: TOLUOL (TOLUENE)

SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT	LEL	TLV	MG/MP	VAPOR PR.
TOLUOL (TOLUENE)	100.00	1.20	100	0	28 @25'C

SECTION 3 - PHYSICAL DATA

BOILING RANGE: 227-232
VAPOR DENSITY: /X/ HEAVIER / / LIGHTER THAN AIR
EVAPORATION RATE: / / FASTER /X/ SLOWER THAN ETHER
PERCENT VOLATILE BY VOLUME: 100
WEIGHT PER GALLON: 7.23

SECTION 4 - FIRE & EXPLOSION HAZARDS

DOT CATEGORY: RED LABEL - FLAMMABLE LIQUID.

FLASH POINT: 40 F. LEL: 1.20

EXTINGUISHING MEDIA: CARBON DIOXIDE, DRY POWDER, FOAM. USE NFPA CLASS B DESIGNED TO EXTINGUISH NFPA CLASS II LIQUID FIRES.

UNUSUAL FIRE & EXPLOSION HAZARDS: KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRIC EQUIPMENT, SPARKS AND OPEN FLAMES. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. DO NO APPLY TO HOT SURFACES.

SPECIAL FIRE FIGHTING PROCEDURES: WATER SPRAY MAY BE INEFFECTIVE. WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT A PRESSURE BUILD-UP AND POSSIBLE SPONTANEOUS IGNITION AND EXPLOSION WHEN EXPOSED TO EXTREME HEAT. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE.

SECTION 5 - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: SEE LOWEST VALUE IN SECTION 2
EFFECTS OF OVEREXPOSURE: INHALATION: ANESTHETIC.
IRRITATION OF THE RESPIRATORY TRACT OR ACUTE NERVOUS SYSTEM DEPRESSION
CHARACTERIZED BY HEADACHE, DIZZINESS, STAGGERING GAIT, CONFUSION,
UNCONCIOUSNESS AND COMA. SKIN OR EYE CONTACT: PRIMARY IRRITANT.
EMERGENCY AND FIRST AID PROCEDURES: FUMES: REMOVE FROM EXPOSURE.
RESTORE BREATHING. KEEP WARM AND QUIET. NOTIFY A PHYSICIAN.
SPLASH (EYES): FLUSH IMMEDIATELY FOR AT LEAST 15 MINUTES WITH COPIOUS
QUANTITIES OF WATER. FOR DEFINITIVE TREATMENT CONSULT PHYSICIAN.
SPLASH (SKIN): WASH AREAS WITH WATER. REMOVE CONTAMINATED CLOTHING.

SECTION 6 - REACTIVITY DATA

STABILITY: / / UNSTABLE /X/ STABLE MATERIALS TO AVOID:
HAZARDOUS DECOMPOSITION PRODUCTS: NONE KNOWN
HAZARDOUS POLYMERIZATION: / / MAY OCCUR /X/ WILL NOT OCCUR
CONDITIONS TO AVOID: HEAT, SPARKS, OR OPEN FLAME.

SECTION 7 - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
REMOVE ALL SOURCES OF IGNITION. AVOID BREATHING VAPORS. VENTILATE AREA.
REMOVE WITH INERT ABSORBENT AND NON-SPARKING TOOLS.
WASTE DISPOSAL METHOD: DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND
FEDERAL REGULATIONS. DO NOT INCINERATE IN CLOSED CONTAINERS.

SECTION 8 - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: EXT. - USE APPROVED MECHANICAL FILTER
RESPIRATOR TO REMOVE OVERSPRAY WHEN SPRAYING.
INT. - USE CHEMICAL MECHANICAL FILTERS DESIGNED TO REMOVE OVERSPRAY
AND SOLVENT FUMES. AREAS OF RESTRICTED VENTILATION (CONFINED AREAS)
USE B.O.M. AIR LINE RESPIRATORS.
VENTILATION: PROVIDE GENERAL DILUTION OR EXHAUST VENTILATION IN
VOLUME AND PATTERN TO KEEP TLV OF MOST HAZARDOUS INGREDIENT IN
SECTION 2 BELOW ACCEPTABLE LIMIT, LEL IN SECTION 4 BELOW STATED
LIMIT, AND TO REMOVE DECOMPOSITION PRODUCTS DURING WELDING OR
FLAME CUTTING ON SURFACES COATED WITH THIS PRODUCT.
PROTCTIVE GLOVES: USE WHEN DESIRED. EYE PROTECTION: USE WHEN DESIRED.
OTHER PROTECTIVE EQUIPMENT: REQUIRED FOR PROLONGED OR REPEATED CONTACT.
PREVENT PROLONGED SKIN CONTACT TO CONTAMINATED CLOTHING.

SECTION 9 - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
KEEP AWAY FROM HEAT, SPARKS OR OPEN FLAME.
OTHER PRECAUTIONS: DO NOT TAKE INTERNALLY. CONTAINERS SHOULD BE
GROUNDED WHEN POURING. AVOID FREE FALL OF LIQUID IN EXCESS OF A
FEW INCHES. DO NOT FLAME CUT, BRAZE OR WELD WITHOUT U.S. BUREAU
OF MINES APPROVED RESPIRATOR OR APPROPRIATE VENTILATION.

Form Approved
Budget Bureau No. 44-R1387
Approval Expires April 30, 1971

U.S. DEPARTMENT OF LABOR

WORKPLACE STANDARDS ADMINISTRATION

Bureau of Labor Standards

MATERIAL SAFETY DATA SHEET

2014-2736

SECTION I

MANUFACTURER'S NAME: FRANKLIN OIL CORP.(OHIO)	EMERGENCY TELEPHONE NO.: 216/ 232-3000
ADDRESS (Number, Street, City, State, and ZIP Code): BOX 46030 - FRANKLIN PARK, CLEVELAND, OHIO 44146	
CHEMICAL NAME AND SYNONYMS: NONE	TRADE NAME AND SYNONYMS: TOOL AID
CHEMICAL FAMILY: CHLORINATED HYDROCARBON	FORMULA: CONFIDENTIAL

SECTION II HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS	N/A		BASE METAL	N/A	
CATALYST	N/A		ALLOYS	N/A	
VEHICLE	N/A		METALLIC COATINGS	N/A	
SOLVENTS 1-1-1, TRICHLOROETHANE	97	350ppm	FILLER METAL PLUS COATING OR CORE FLUX	N/A	
ADDITIVES	3		OTHERS	N/A	
OTHERS	N/A				

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III PHYSICAL DATA

BOILING POINT (°F.)	162° F	SPECIFIC GRAVITY (H_2O=1)	1.318
VAPOR PRESSURE (mm Hg.)	101	PERCENT VOLATILE BY VOLUME (%)	97%
VAPOR DENSITY (AIR=1)	4.55	EVAPORATION RATE (CTC =1)	1.0
SOLUBILITY IN WATER	NONE		
APPEARANCE AND ODOR	CLEAR BLUE LIQUID, MILD CHLOROFORM LIKE ODOR.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used): NONE		FLAMMABLE LIMITS @ 25°C	Lel: 8.0	Uel: 10.5
EXTINGUISHING MEDIA: FOAM, WATER FOG				
SPECIAL FIRE FIGHTING PROCEDURES				
UNUSUAL FIRE AND EXPLOSION HAZARDS: COMBUSTION PRODUCTS CONTAIN HCl				

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SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
For 8 hour day - 350 ppm time weighted average.

EFFECTS OF OVEREXPOSURE
1,1,1-trichloroethane is one of the least toxic of the chlorinated hydrocarbons.

The vapors have a weak anesthetic action.

EMERGENCY AND FIRST AID PROCEDURES
Remove person from contaminated area; apply artificial respiration if breathing has stopped; remove contaminated clothing and wash skin with warm soap and water; if taken internally, induce vomiting (if person is conscious - do not induce vomiting in an unconscious person); if eyes have been contacted, wash with copious quantities of water - call a physician.

SECTION VI REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID: Unstabilized solvent may react with aluminum. (With stabilizer) avoid removal of stabilizers and prolonged contact with water.
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*
Rubber, plastic; unstabilized solvent readily corrodes aluminum and aluminum alloys.

HAZARDOUS DECOMPOSITION PRODUCTS Toxic decomposition products are formed at elevated temperatures. (Hydrogen Chloride, Phosgene Chlorine.)

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Spilled 1,1,1-trichloroethane may be removed by mopping or absorbing with rags. Provide adequate ventilation. Clothing wet with 1,1,1,-TCE should be removed immedicately and the affected area washed with soap and water.

WASTE DISPOSAL METHOD
Residue may be poured on dry sand, earth, or ashes at a safe distance from occupied areas and allowed to evaporate into the atmosphere.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*
Self-contained breathing apparatus; canister-type gas mask.

VENTILATION	LOCAL EXHAUST: Floor level ventilation		SPECIAL
	MECHANICAL *(General)*: Downdraft		OTHER
PROTECTIVE GLOVES	Polyvinyl alcohol or neoprene	EYE PROTECTION	Chemical safety goggles
OTHER PROTECTIVE EQUIPMENT			

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Floor level ventilation. Vents in tanks for filling and breathing losses. Vents from indoor tanks should terminate outdoors.

OTHER PRECAUTIONS
Avoid open flames and sparks.

5/76

SUBMITTED BY T. A. Fairman

T. A. FAIRMAN, CHEMIST
ADMINISTRATIVE-TECHNICAL SALES

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

HITCHINER
MANUFACTURING CO., INC.
MILFORD, NEW HAMPSHIRE 03055
TELEPHONE (603) 673-1100 TWX (710) 366-1863
TELEX 953014 CABLE ADDRESS HITCHINER

THIS MATERIAL SAFETY DATA SHEET SUPPLIED FOR: Tool Steels

DATE: November, 1985

II. HAZARDOUS INGREDIENTS

The terms "hazardous" and "hazardous materials" as used within this MSDS should be interpreted as defined by, and in accordance with, the OSHA Hazard Communication Standard (29 CFR Part 1910, 1200) including cited Appendices, Lists, References, etc., all of which are hereby incorporated by reference.

MATERIAL OR COMPONENT	CAS. NO.	OSHA PEL (Mg/M^3)		ACGIH TLV (Mg/M^3)
COBALT	7440-48-4	0.1		0.1
CHROMIUM	7440-47-3	1.0		.50
IRON	1309-37-1	10		5
MANGANESE	7439-96-5 (Dust)	5 (Ceiling)		5 (Ceiling)
	(Fume)	–		1
MOLYBDENUM	7439-98-7	15		10
NICKEL	7440-02-0	1		1
VANADIUM	1314-62-1 (Dust)	.5 (Ceiling)		.05
	(Fume)	.1 (Ceiling)		.05
TITANIUM	13463-67-7	15		5
CARBON	1333-86-4	3.5	5	3.5 (As Carbon Black)
TUNGSTEN	7440-33-7	–	–	5
SILICON	7440-21-2 (Dust)	–		5
ALUMINUM	7429-90 (Dust)	–	–	10
	(Fume)	–	–	5

III. PHYSICAL DATA

BOILING POINT: 5000°F
SPECIFIC GRAVITY (H_2)=1): Approx. 7.8-8.2 (60°F)
VAPOR DENSITY (AIR=1): N/A
% VOLATILES BY VOLUME: N/A
APPEARANCE & ODOR: Various Shapes, Solid, Odorless Metal

MELTING POINT: Approx. 2500°F
VAPOR PRESSURE: N/A
SOLUBILITY IN H_2O: Insoluble
EVAPORATION (BUTYL ACETATE=1): N/A

IV. FIRE AND EXPLOSION DATA

FLASH POINT: None

FIRE POINT: None

V. HEALTH HAZARD INFORMATION

WE DO NOT CONSIDER THIS PRODUCT IN THE FORM IT IS SOLD TO CONSTITUTE A PHYSICAL HAZARD OR A HEALTH HAZARD. SUBSEQUENT OPERATIONS SUCH AS ABRADING, MELTING, WELDING, CUTTING OR PROCESSING IN ANY OTHER FASHION MAY PRODUCE POTENTIALLY HAZARDOUS DUST OR FUME WHICH CAN BE INHALED, SWALLOWED, OR COME IN CONTACT WITH THE SKIN OR EYES.

PRIMARY ROUTES OF ENTRY:	EMERGENCY FIRST AID:
Inhalation	Remove to fresh air, if condition continues, consult physician.
Eye Contact	Flush well with running water to remove particulate. Get medical attention.
Skin Contact	Brush off excess dust. Wash area well with soap and water.
Ingestion	Seek medical help if large quantities of material have been ingested.

EFFECTS OF EXPOSURE: No toxic effects would be expected from exposure to the solid forms of specialty steel. Prolonged, repeated exposure to fumes or dusts generated during heating, cutting, brazing or welding may or may not cause adverse health effects associated with the listed constituents in excess of OSHA permissible exposure limits established in 29 CFR Subpart Z. (See Section II).

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V. HEALTH HAZARD INFORMATION (Con.'t)

EXPOSURE LIMITS: Section II lists specific ingredients and permissible exposure limits.

IMPORTANT: Determine actual exposure by industrial hygiene monitoring.

POSSIBLE SIGNS AND SYMPTOMS OF EXPOSURE TO DUST, WELDING FUME AND GASES:

SHORT TERM EXPOSURE:	Metallic taste; nausea, tightness of chest; fever; irritation of eyes, nose, throat and skin; loss of consciousness/death due to welding gases or lack of oxygen.
LONG TERM EXPOSURE:	There are no adverse effects from the products in their solid form. Adverse effects may or may not result from long-term (chronic) exposure to dust, fume, gases, etc. that occur by way of subsequent operations on the product. Some studies would associate one (or more) of the constituents (per Section II) with the potential for neurologic, pulmonary, respiratory, skin or other disease. Chromium, cobalt and nickel in various chemical compounds have been identified as suspect human carcinogens by the I.A.R.C., N.T.P. Annual Report. We believe there are no reliable scientific studies which show that workers exposed to operations upon our alloys suffer increased incidence of lung cancer or other disease because of their exposure to the forms of chromium, nickel or other elements in our products.

AGGRAVATION OF PRE-EXISTING RESPIRATORY OR ALLERGIC CONDITIONS MAY OCCUR IN SOME WORKERS.

VI. REACTIVITY DATA

STABILITY:	Chemically Stable
INCOMPATIBILITY:	Reacts with Strong Acids to Generate Hydrogen Gas
HAZARDOUS DECOMPOSITION PRODUCTS:	Metallic Oxides

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE OF RELEASE OR SPILL: N/A

WASTE DISPOSAL METHOD:

Solids –	Sale as Scrap for Reuse
Dust, etc. –	Follow Federal, State and Local Regulations Regarding Disposal

VIII. SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS:

General – Recommended (To keep airborne concentration of dust and fumes below ACGIH TLV'S)

Local – As Required

PERSONAL PROTECTIVE EQUIPMENT:

Respiratory Protection:	~~If Fumes, misting or dust condition occurs and~~ T.L.V. ~~as indicated in Section~~ II is exceeded, provide NIOSH approved respirators.
Eye Protection:	Recommend approved safety glasses or goggles when working with dusty material.
Gloves:	As Required.
Other Clothing or Equipment:	As Required.

IX. SPECIAL PRECAUTIONS

USE GOOD HOUSEKEEPING PRACTICES TO PREVENT ACCUMULATIONS OF DUSTS AND TO KEEP AIRBORNE DUST CONCENTRATIONS AT A MINIMUM.

THIS MATERIAL IS POTENTIALLY CONTAMINATED WITH COATINGS SUCH AS OILS FOR PRESERVATIVES AND OTHER CONTAMINANTS. IF THE MATERIAL IS CONTAMINATED, SPECIAL PRECAUTIONS (SUCH AS PROCESS CONTROL AND PERSONAL PROTECTIVE EQUIPMENT APPROPRIATE TO THE NATURE OF THE SUSPECTED CONTAMINANTS SHOULD BE TAKEN TO AVOID RESULTING EXPOSURES WHEN HANDLING, CUTTING [THERMAL OR MECHANICAL] AND/OR HEATING OR MELTING.

While the information set forth on this material safety data sheet is believed to be accurate, as of the effective date, Hitchiner Mfg. Co. makes no representations regarding the accuracy or completeness of the information and assumes no liability for any loss, damage, or injury of any kind which may result from or arise out of the use or reliance on the information by any person.

N/A = NOT APPLICABLE

Material Safety Data Sheet

PPG Inc
[illegible]ter
[illegible]2222

Chemicals PPG INDUSTRIES

Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20

Date: April , 1982	Edition: Sixth
Chemical Name and Synonyms: 1,1,1-trichloroethane; methylchloroform CAS No. 71-55-6	Trade Name and Synonyms: [redacted]®
Chemical Family: Halogenated Hydrocarbons	Formula: CH_3CCl_3
DOT Shipping Name: 1,1,1-trichloroethane	DOT Hazard Class: ORM-A
Reportable Quantity:	I. D. Number: UN 2831

SECTION 1 · PHYSICAL DATA

Boiling Point @ 760 mm Hg: 165.4°F	Vapor Density (Air=1): 4.54	Specific Gravity (H_2O=1): 1.300-1.320 @ 25°/25°C	pH of Solutions: 6.0 to 7.5
Freezing/Melting Point: -49°F -45°C	Solubility (Weight % in Water): Negligible	Bulk Density: 10.80-10.97 lbs/gal @ 25°C	Volume % Volatile: 100
Vapor Pressure: @25°C = 135mmHg	Evaporation Rate (ethyl ether = 1): 0.35	Heat of Solution: Not Applicable	Appearance and Odor: Clear, colorless liquid - ether-like odor.

SECTION 2 · HAZARDOUS INGREDIENTS

	%	Hazard Data
1,1,1-trichloroethane (Stabilized)	100	See Below

SECTION 3 · FIRE AND EXPLOSION HAZARD DATA

Flash Point °F (Method Used) None when tested in accordance with DOT requirements.	Flammable Limits in Air (% by Volume) LEL: 7% UEL: 15% See Below	Extinguishing Media: water, dry chemical or carbon dioxide

Special Fire Fighting Procedures: Fire fighters should wear a NIOSH/MSHA-approved pressure-demand, self-contained breathing apparatus for possible exposure to hydrogen chloride and possibly traces of phosgene.

Unusual Fire and Explosion Hazards: Vapors concentrated in a confined or poorly ventilated area can be ignited upon contact with a spark, flame, or high intensity source of heat. This can occur at concentrations ranging between 7-15% by volume. Decomposition or burning can produce hydrogen chloride or possibly traces of phosgene.

SECTION 4 · HEALTH HAZARD DATA

Toxicity Data	Classification (Poison, Irritant, Etc.)
LC_{50} Inhalation rat 8,000 ppm/7 hours	Inhalation: Toxic
LD_{50} Dermal rabbit > 15g/kg(2)	Skin Not significantly toxic
n/Eye Irritation See Section 5	Skin/Eye: Liquid mildly irritating to skin; eye irritant
LD_{50} Ingestion rat 10-12g/kg (See Section 5)	Ingestion: Not significantly toxic
Fish, LC_{50} (Lethal Concentration) Not Determined	Aquatic:

24-HOUR EMERGENCY ASSISTANCE: (304) 843-1300

TRW-02605

0908-3987

SECTION 5 · EFFECTS OF OVEREXPOSURE

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure.

Permissible Exposure Limits (TLV): 350 ppm - 8-hour time-weighted average (TWA) - OSHA 29CFR 1910.1000 (May 28, 1975). PPG internal permissible exposure limit is 350 ppm 8-hour TWA with a short-term exposure limit (STEL) of 450 ppm for any 15-minute excursion period.

Acute

Primarily a central nervous system depressant. Inhalation can cause irritation of the respiratory system, dizziness, nausea, lightheadedness, headache, loss of coordination and equilibrium, unconsciousness and even death in confined or poorly ventilated areas. Depression of the circulatory system has been reported as a result of overexposure to Tri-Ethane®. The heart may be sensitized by Tri-Ethane®, and ventricular arrhythmia may be induced by epinephrine administration.

Liquid splashed in the eyes can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

Chronic

Prolonged exposure above the OSHA permissible exposure limits may result in liver and kidney damage. Tri-Ethane® has been extensively studied for cancer both in the U.S. and Europe by government, industry and academia in multiple species and biological test specimens. Recent reviews of these data by the Science Advisory Board to EPA's carcinogen assessment group concluded that there was no evidence to support the carcinogenicity of Tri-Ethane®. There is no documented evidence that Tri-Ethane® causes an increased cancer incidence in humans.

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

Eye or Skin Contact: Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

Ingestion: If conscious, drink large quantities of water. DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital. DO NOT give anything by mouth to an unconscious person.

Notes to Physician (Including Antidotes): NEVER administer adrenalin following Tri-Ethane® overexposure. Increased sensitivity of the heart to adrenalin may be caused by over-exposure to Tri-Ethane®.

SECTION 6 · REACTIVITY DATA

Stability: Stable	**Conditions to Avoid:** Avoid open flames, hot glowing surfaces or electric arcs.
Hazardous Polymerization: Will not occur.	**Conditions to Avoid:** None

Incompatibility (Materials to Avoid): Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed.

Hazardous Decomposition Products: Hydrogen chloride and possibly traces of phosgene.

SECTION 7 · SPILL OR LEAK PROCEDURES

Steps to be Taken if Material is Spilled or Released: Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below)

Waste Disposal Method: Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be re-processed or incinerated or must be treated in a permitted hazardous waste management facility.[7] Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act as well as any other relevant federal, state or local laws/regulations regarding disposal.

SECTION 8 · SPECIAL PROTECTION INFORMATION

Respiratory Protection: For emergencies or working in confined areas, wear self-contained breathing apparatus or suppplied air respiratory protection. In other circumstances involving potential overexposure, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer). Respiratory protection program must be in accordance with 29CFR 1910.134.

Ventilation (Type): Dilution (General) or Local Exhaust - Sufficient to maintain workplace concentration below permissible exposure limits.

Eye Protection: Splashproof Goggles | **Gloves:** polyethylene, neoprene or polyvinyl alcohol

Other Protective Equipment: Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

SECTION 9 · SPECIAL PRECAUTIONS

Precautions to be Taken During Handling and Storing:

- Do not use in poorly ventilated or confined areas.
- Tri-Ethane® vapors are heavier than air and will collect in low areas.
- Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with Tri-Ethane®.
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage, and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.
- A chlorinated solvent used as a flashpoint suppressant must be added in sufficient quantity or the resultant mixture may have a flashpoint lower than the flammable component.
- Caution should be taken not to use in pressurized or totally enclosed system of aluminum construction. Example, paint or adhesive spray system.

Other Precautions:

- AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long-term overexposure may cause liver/kidney injury.
- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit employee exposure to Tri-Ethane® below OSHA permissible limits (8-hour TWA 350ppm). Observance of lower limits (outlined in Section 4) is advisable.
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.
- DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS.

References:

1. NIOSH Registry of Toxic Effects of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F. A. Patty, 1963
3. Dangerous Properties of Industrial Materials, Fifth Edition, N. I. Sax, 1979
4. Industrial Toxicology, Hamilton and Hardy, 1974
5. Toxicity and Metabolisms of Industrial Solvents, Browning, 1965
6. Toxicology, the Basic Science of Poisons, Casarett and Doull, 1980
7. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
8. EPA Science Advisory Board, Subcommittee on Airborne Carcinogens, Septemb

0908-3990

Mgr., Product Safety

TRW-02608

Form Approved
Budget Bureau No. 44-R1387
Approval Expires April 30, 1971

Form No. LSB-OOS-4
May 1969

CARR
CATALOG 41660

U.S. DEPARTMENT OF LABOR

WAGE AND LABOR STANDARDS ADMINISTRATION
Bureau of Labor Standards

CAT 41660
AXTON CROSS
PPG INDUSTRIES

MATERIAL SAFETY DATA SHEET

TRICHLORETHYLENE

12.2 wt

SECTION I

MANUFACTURER'S NAME: PPG Industries, Inc.	EMERGENCY TELEPHONE NO.: (412) 434-3131
ADDRESS (Number, Street, City, State, and ZIP Code): No. 1 Gateway Center, Pittsburgh, Pa. 15222	
CHEMICAL NAME AND SYNONYMS: Trichlorethylene - Trichloroethylene	TRADE NAME AND SYNONYMS: [redacted]
CHEMICAL FAMILY: Chlorinated Hydrocarbons	FORMULA: $CCl_2 = CHCl$

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS	100	100	FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

BOILING POINT (°F.)	188.4	SPECIFIC GRAVITY (H_2O=1)	1.46
VAPOR PRESSURE (mm Hg.)	58	PERCENT VOLATILE BY VOLUME (%)	100
VAPOR DENSITY (AIR=1)	4.54	EVAPORATION RATE (ether =1)	0.28
SOLUBILITY IN WATER	Negligible		
APPEARANCE AND ODOR	Clear, colorless, ethereal odor		

SECTION II - HAZARDOUS FIRE AND EXPLOSION DATA

FLASH POINT (Method used): None (Tag, open or closed)	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA			
SPECIAL FIRE FIGHTING PROCEDURES			
UNUSUAL FIRE AND EXPLOSION HAZARDS: Vapors can be ignited only by high intensity source of ignition. Combustion forms HCl and possible traces of phosgene.			

5781

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: 100

EFFECTS OF OVEREXPOSURE: Loss of co-ordination and equilibrium to actual unconsciousness, and even death, in unventilated areas (such as tanks).

EMERGENCY AND FIRST AID PROCEDURES: Move to fresh air, use artificial respiration if breathing has stopped. Administer oxygen after breathing has been restored. (Never administer adrenalin!) Call physician (he should not administer adrenalin).

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*: Avoid mixing with caustic soda and caustic potash.

HAZARDOUS DECOMPOSITION PRODUCTS: HCl and possible traces of phosgene

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Adequate ventilation must be provided. Workmen should be provided with fresh air masks or sent to fresh air.

WASTE DISPOSAL METHOD: Forced ventilation or evaporation

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*: Fresh air masks when necessary

VENTILATION	LOCAL EXHAUST: Sufficient to maintain TLV	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES: Neoprene or Viton	EYE PROTECTION: Glasses or goggles

OTHER PROTECTIVE EQUIPMENT: Neoprene apron

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

OTHER PRECAUTIONS

Diamond Shamrock

Eastern Regional Sales Office

TO J. THIMES
FOR YOUR RECORD
T. COSTELLO
12/13/77

November 14, 1977

cc. F. WOLF

T R W Carr Division
31 Ames Street
Cambridge, Massachusetts 02142

Attention: Mr. T. Costello, Purchasing Agent

Dear Mr. Costello:

Subject: Carcinogenicity Potential of Trichlorethylene

In addition to our desire to supply you with chlorinated solvents, Diamond Shamrock also feels that it is our responsibility to keep you informed about the latest developments in environmental and/or health hazards regarding chlorinated solvents.

Diamond Shamrock's Health and Environmental Affairs Department recently received preliminary results from a long-term study indicating that breathing high levels of trichlorethylene can produce liver cancer in one strain of laboratory mice and, therefore, may be capable of producing cancer in humans. However, identical tests have not shown similar effects on rats, and it is difficult to determine if a mouse test really shows the effect of trichlor on human beings.

Our record to date with trichlor has been good. We are not aware of any long-term problems related to it among our employees. Similarly, we have not heard of any incidence of cancer among any of our customers or other users or producers of trichlor.

The study in question follows the release by the government in 1975 of test data showing increased levels of liver cancer in laboratory mice fed large doses of trichlor. Workers exposure is usually in the air and not by ingestion. In 1976 the trichlor producers, including Diamond Shamrock, funded a $600,000 inhalation study on rats and the same strain of mouse. This study has completed twenty-three of it's twenty-four months duration, nearly the entire life span of the animals.

Results so far show a twofold increase in liver cancer in the mice exposed to 600 parts per million (ppm) of trichlor in the air for seven hours a day, five days a week when compared to similar mice breathing

TRW-02611

0908-3993

pure air. Mice exposed to lower levels and rats exposed to the same and lower levels showed no significant effects at this stage of the study. A relatively small number of the animals have been examined at this time. Final results are expected early to mid-1978, and they will be released as soon as they are available to Diamond Shamrock.

These tests were conducted by Industrial Biotest Labs in Decatur, Illinois under the guidance of the Manufacturing Chemists Association (MCA). These preliminary results have been released to government agencies including NIOSH, FDA, EPA and OSHA. The present OSHA standard for trichlor exposure in the workplace is a time weighted average of 100 parts per million (ppm) over an eight hour day (or, one-sixth the levels that the preliminary report finds effect mice). Diamond Shamrock will do its best to keep you informed of any future developments concerning trichlor or any of the other chlorinated solvents.

J. H. Willert
District Sales Manager
DIAMOND SHAMROCK CORPORATION
Electro Chemicals Division

Vulcan CHEMICALS

MATERIAL SAFETY DATA SHEET

24 Hour Emergency Phone (316) 524-5751

Division of Vulcan Materials Company / P.O. Box 7689 • Birmingham, AL 35253-0689

I – IDENTIFICATION

CHEMICAL NAME	CHEMICAL FORMULA	MOLECULAR WEIGHT
Trichloroethylene	C_2HCl_3	131.38

TRADE NAME
Trichloroethylene, Metal Degreasing Grade

SYNONYMS	DOT IDENTIFICATION NO
Ethylene Trichloride	UN 1710

II – PRODUCT AND COMPONENT DATA

COMPONENT(S) CHEMICAL NAME	CAS REGISTRY NO	% (Approx)	ACGIH TLV-TWA
Trichloroethylene	79-01-6	100	50 ppm

III – PHYSICAL DATA

APPEARANCE AND ODOR	SPECIFIC GRAVITY
Colorless clear liquid; mildly sweet odor	1.45 @ 25/25°C
BOILING POINT	**VAPOR DENSITY IN AIR (Air = 1)**
188°F (86.7°C)	4.5
VAPOR PRESSURE	**% VOLATILE BY VOLUME**
58 mm Hg @ 20°C	100
EVAPORATION RATE	**SOLUBILITY IN WATER**
(ether = 1): 0.3	0.1 gm/100 gm @ 25°C

IV – REACTIVITY DATA

STABILITY	CONDITIONS TO AVOID
Stable	Avoid contact with open flame, electric arcs, or other hot surfaces which can cause thermal decomposition.

INCOMPATIBILITY (Materials to avoid)

Strong alkalies, oxidizers, barium, lithium, magnesium, and titanium.

HAZARDOUS DECOMPOSITION PRODUCTS

Hydrogen chloride, phosgene, chlorine.

HAZARDOUS POLYMERIZATION

Will not occur.

V – FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS IN AIR
None (TCC)	8.0% – 10.5% in air @ 25°C

EXTINGUISHING AGENTS
Foam, dry chemical, carbon dioxide (CO_2)

UNUSUAL FIRE AND EXPLOSION HAZARDS
Toxic gases formed by thermal decomposition. Concentrated vapors can be ignited by high intensity energy source. Firefighters should wear self contained positive-pressure breathing apparatus, and avoid skin contact.

VI – TOXICITY AND FIRST AID

EXPOSURE LIMITS (When exposure to this product and other chemicals is concurrent, the TLV must be defined in the workplace.)

ACGIH: 50 ppm (8 hr) TWA, 200 ppm STEL OSHA: 100 ppm (8 hr) TWA, 200 ppm Ceiling (for peak concentration refer to 29 CFR 1910.1000)

(Odor threshold approximately 60 ppm, causes olfactory fatigue)

Consumption of alcoholic beverages may increase the potential for development of toxic effects resulting from exposure to this product.

Effects described in this section are believed not to occur if exposures are maintained at or below appropriate TLVs. Because of the wide variation in individual susceptibility, TLVs may not be applicable to all persons and those with medical conditions listed below.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Acute and chronic kidney or liver disease, rhythm disorders of the heart, and neuritis and other disorders of the nervous system.

ACUTE TOXICITY Primary route(s) of exposure ☒ Inhalation ☐ Skin Absorption ☐ Ingestion

Inhalation: Major potential route of exposure. Depresses the central nervous system. Symptoms of exposure above 100 ppm include headaches, nausea, vomiting, dizziness, vertigo, fatigue, lightheadedness and coughing. Exposure above 1000 ppm can cause adverse effects on visual perception and motor skills. Ventricular arrhythmias and very rapid respiration have been observed in individuals exposed to 15,000 ppm. High concentrations or prolonged overexposure can cause unconsciousness and death.

Skin: Prolonged or repeated skin contact can cause irritation, defatting of skin, and dermatitis. Absorption of liquid through intact skin is possible, causing systemic poisoning, but this is an unlikely route of significant toxic exposure.

Eyes: Liquid can cause pain and slight temporary injury to eyes. Vapors can irritate eyes.

Ingestion: Single dose toxicity is low to moderate. If vomiting occurs, trichloroethylene can be aspirated into the lungs, which can cause chemical pneumonia and systemic effects.

FIRST AID

Inhalation: Remove to fresh air. If breathing has stopped, administer artificial respiration. Call a physician.

Skin: Remove contaminated clothing and shoes. Wash skin with soap and water. Decontaminate clothing before reuse.

Eyes: Flush eyes immediately with water for at least 15 minutes. If irritation persists, call a physician.

Ingestion: Do not induce vomiting. Contact physician or emergency medical facility immediately.

NOTE TO PHYSICIAN: Adrenalin should never be given to persons overexposed to trichloroethylene.

CHRONIC TOXICITY

The finding of chronic toxic effects in laboratory animals may indicate toxicity to humans. Overexposure should be avoided, failure to do so could result in injury, illness or even death.

Chronic overexposure to trichloroethylene has caused toxic effects in the liver, lymphatic (one species), kidney, and cardiovascular system of laboratory animals. Humans exposed to trichloroethylene can become intolerant to ethyl alcohol, with small quantities causing inebriation and skin blotches.

Carcinogenicity - Trichloroethylene has been evaluated for possible cancer causing effects in laboratory animals. Ingestion studies in $B_6C_3F_1$ mice exposed to concentrations up to 2,239 mg/kg males and 1,739 mg/kg females found statistically significant increase in liver tumors. Ingestion studies of Osborne-Mendal rats exposed to concentrations up to 1,097 mg/kg found no statistically significant increase in cancer. Inhalation studies of Wistar rats, NMRI mice and Syrian hamsters exposed to concentrations up to 500 ppm found no statistical increase in cancer except in the female mice where significant increases in lymphoma's were observed.

The International Agency for Cancer Research considers liver tumors in mice as limited evidence of animal carcinogenicity.

Five Epidemiological studies using a variety of testing approaches have found no increased incidence of cancer in groups exposed to trichloroethylene.

Trichloroethylene is not listed on the IARC, NTP or OSHA carcinogen lists.

Reproductive Toxicity: Reproductive toxicity tests have been conducted to evaluate the adverse potential effects trichloroethylene may have on reproduction and offspring of laboratory animals. Results indicate trichloroethylene did not cause birth defects in mice, rats or rabbits. Trichloroethylene did delay the normal development of rats but this delay did not affect later life.

VII – PERSONAL PROTECTION AND CONTROLS

RESPIRATORY PROTECTION

Where vapor concentration exceeds or is likely to exceed 50 ppm, an approved organic vapor type respirator is acceptable. Approved self-contained breathing apparatus or air line respirator, with full face piece, is required for vapor concentrations above 1,000 ppm and for spills and/or emergencies. Follow all applicable respirator use standards and regulations.

VENTILATION

Do not use in closed or confined space. Open doors and or windows. Use ventilation to maintain exposure levels below 50 ppm (TWA).

SKIN PROTECTION

Wear solvent-resistant gloves such as Viton, polyvinyl alcohol, or equivalent. Solvent-resistant boots, apron, headgear and/or faceshield should be worn where splashing is possible.

EYE PROTECTION

Wear safety glasses. Contact lenses should not be worn. Chemical goggles and/or face shields should be worn where splashing is possible.

HYGIENE

Avoid contact with skin and avoid breathing vapors. Do not eat, drink, or smoke in work area. Wash hands prior to eating, drinking, or using restroom.

OTHER CONTROL MEASURES

To determine the exposure level(s), monitoring should be performed regularly. Safety shower and eyewash station should be available.

NOTE: Protective equipment and clothing should be selected, used, and maintained according to applicable standards and regulations. For further information, contact the clothing or equipment manufacturer or the Vulcan Chemicals Technical Service department.

VIII – STORAGE AND HANDLING PRECAUTIONS

Follow protective controls set forth in Section VII when handling this product.
Store in tightly sealed, labeled containers in a cool, dry, well-ventilated area. Prevent water or moist air from entering storage tanks or containers. Do not cut or weld on empty or full drums.
Aluminum equipment should not be used for storage and/or transfer.
Vapors are heavier than air and will collect in low areas.
Do not remove or deface labels. Do not reuse drum without recycling or reconditioning in accordance with any applicable federal, state or local laws.
Contact with aluminum parts in a pressurizable fluid system may cause violent reactions.
Consult equipment supplier for further information.
Liquid oxygen or other strong oxidants may form explosive mixtures with trichloroethylene. Consult supplier before using in liquid oxygen service.

IX – SPILL LEAK AND DISPOSAL PRACTICES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Evacuate the area, ventilate, and avoid breathing vapors. Dike area to contain spill. Clean up area (wear protective equipment – refer to Section VII) by mopping or with absorbent material, and placing in closed container for disposal. Avoid contamination of ground and surface waters. Do not flush to sewer.

If spill occurs indoors, turn off heating and/or air conditioning systems, to prevent vapors from contaminating entire building.

WASTE DISPOSAL METHOD

Recovered liquids may be sent to a licensed reclaimer or incineration facility. Contaminated material must be disposed of in a permitted waste management facility. Consult federal, state, or local disposal authorities for approved procedures.

X – TRANSPORTATION

DOT HAZARD CLASSIFICATION

ORM-A

PLACARD REQUIRED

None

LABEL REQUIRED

ORM-A. Label as required by OSHA Hazard Communication Standard, and any applicable state and local regulations.

Medical Emergencies

Call collect 24 hours a day for emergency toxicological information 415 821-5338

Other Emergency information

Call 316 524-5751 (24 hours)

For any other information contact:

Vulcan Chemicals
Technical Service Department
P. O. Box 7689
Birmingham, AL 35253-0689
205 877-3459
8 AM to 5 PM Central Time
Monday through Friday

DATE OF PREPARATION May 1, 1986

1/15

OCCIDENTAL CHEMICAL
MATERIAL SAFETY DATA SHEET

MSDS NUMBER: M1103

MSDS DATE: 11-16-87

PRODUCT NAME: TRICHLOROETHYLENE VAPOR DEGREASING GRADE

24 HOUR EMERGENCY PHONE: (716) 278-7021

I. PRODUCT IDENTIFICATION

3* HEALTH HAZARD, 1 FIRE HAZARD, & 0 REACTIVITY
Based on the National Paint & Coatings Association HMIS rating system.

MANUFACTURER'S NAME AND ADDRESS: Occidental Chemical Corporation, Customer Service, Occidental Tower, P O Box 809050, Dallas, Texas 75380 — Telephone (1-800-752-5151)

CHEMICAL NAME: 1,1,2-Trichloroethylene CAS NUMBER: 79-01-6

SYNONYMS/COMMON NAMES: Triclene D

CHEMICAL FORMULA: CHCl=CCl2

DOT PROPER SHIPPING NAME: Trichloroethylene

DOT HAZARD CLASS: ORM-A

DOT I.D. NUMBER: UN1710 HAZARDOUS SUBSTANCE: RQ1000

II. HEALTH HAZARD INFORMATION

EMERGENCY AND FIRST AID PROCEDURES

EYES:
OBJECT IS TO FLUSH MATERIAL OUT, THEN SEEK MEDICAL ATTENTION. IMMEDIATELY flush eyes with large amounts of water for at least 15 minutes, holding lids apart to ensure flushing of the entire eye surface. SEEK MEDICAL ATTENTION.

SKIN:
Wash contaminated areas with plenty of soap and water. A soothing ointment may be applied to irritated skin after thorough cleansing. Remove contaminated clothing and footwear and wash clothing before reuse. Discard footwear which cannot be decontaminated. SEEK MEDICAL ATTENTION.

INHALATION:
Remove to fresh air. If breathing has stopped give mouth-to-mouth resuscitation. If breathing is difficult, have trained person administer oxygen. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION:
Immediate Treatment: DO NOT INDUCE VOMITING. If more than trace quantities have been swallowed and the patient is conscious, wash out mouth with water and give 200-300 ml (half a pint) of warm water to drink. Obtain immediate medical attention on site or transport to hospital. Further Medical Treatment: Following ingestion adsorbents such as activated charcoal may be of value. Gastric lavage may be effective when performed by a physician within 4 hours of ingestion.

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II. HEALTH HAZARD INFORMATION (Continued)

NOTES TO PHYSICIAN:
Caution: Epinephrine or other stimulant may cause ventricular arrhythmia due to potentiation of endogenous epinephrine. Ethyl Alcohol markedly augments the health effects of trichloroethylene.

Medical Conditions Generally Aggravated by Exposure

MEDICAL LIMITATIONS: Any condition or symptom discussed above.

ROUTES OF EXPOSURE

INHALATION:
Excessive inhalation may produce symptoms of central nervous system depression, ranging from light-headedness, nausea and vomiting, to unconsciousness and death.

SKIN:
Mildly irritating to skin. Skin contact may produce a burning sensation. Prolonged or repeated contact may cause skin to become reddened, rough, and dry due to the removal of natural oils and may result in dermatitis.

May be absorbed through the skin, although not expected to produce toxicity through this route.

EYE CONTACT:
An irritant of the eyes, causing pain, lacrimation, and general inflammation.

INGESTION:
May cause irritation of the gastrointestinal tract with vomiting. If vomiting results in aspiration, chemical pneumonia may follow. Absorption through the gastrointestinal tract may produce symptoms of central nervous system depression ranging from light-headedness to unconsciousness.

EFFECTS OF OVEREXPOSURE

ACUTE:
Excessive inhalation or ingestion may produce symptoms of central nervous system depression ranging from light-headedness, to unconsciousness and death. Exposure of the eyes and skin may produce irritation.

CHRONIC:
Can cause headache, mental confusion, depression, fatigue, loss of appetite, nausea, vomiting, cough, loss of sense of balance, and visual disturbances and an intolerance to alcohol. Prolonged or repeated skin contact may cause dermatitis.

HEALTH HAZARD DATA:

Acute Oral LD50= 4920 to 7193 mg/kg (rat)
Acute Inhalation LC50= 8000 ppm/4 hrs (rat)

IARC lists this product has having inadequate evidence in humans and limited in animals to evaluate carcinogenicity, (Group 3).

NTP - A study has shown that in the laboratory mouse using large doses there was an increase in the rate of spontaneous malignant liver tumors.

MEDICAL LIMITATIONS: Alcohol consumed before or after exposure may increase adverse reactions.

III. HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENT	HAZARD DATA	CAS NUMBER	%
Trichloroethylene	PEL= 100 ppm 8hr TWA PEL= 200 ppm Ceiling Value PEL= 300 ppm for 5 min in any 2 hrs. TLV= 50 ppm 8 hr TWA TLV= 200 ppm STEL	79-01-6	99.4
1,2 Butylene oxide	40 ppm has been suggested	106-88-7	<0.6

See Section II

This material is listed in the TSCA Inventory.
Not listed as carcinogenic by IARC, NTP, OSHA, ACGIH

IV. FIRE AND EXPLOSION DATA

FLASH POINT: None (TCC) AUTOIGNITION TEMPERATURE: 410°C (770°F)

FLAMMABLE LIMITS IN AIR, % BY VOLUME- UPPER: 10.5%
LOWER: 8%

EXTINGUISHING MEDIA:
Fires involving this product are unlikely, but should one occur, it may be controlled by carbon dioxide, dry chemicals or water spray.

SPECIAL FIRE FIGHTING PROCEDURES:
Pressure-demand, self-contained breathing apparatus should be provided for fire fighters in building or confined areas where product is stored. Storage containers exposed to fire should be kept cool with a water spray, in order to prevent pressure buildup.

UNUSUAL FIRE AND EXPLOSION HAZARD:
This product is nonflammable and nonexplosive under normal conditions of use. At high temperatures, this product decomposes to give off hydrochloric acid gas plus other toxic and irritating vapors such as phosgene. If storage containers are exposed to excessive heat, over-pressurization of the containers can result.

V. SPECIAL PROTECTION

VENTILATION REQUIREMENTS:
Use in well-ventilated areas. Where engineering controls are not feasible, use adequate local exhaust ventilation.

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY:
Respiration protection is not required under normal use. However, use a NIOSH/MSHA approved respirator following manufacturer's recommendations where vapor, mist or spray may be generated.

EYE:
Face shield and goggles or chemical goggles should be worn.

GLOVES:
Impervious gloves should be worn. Gloves contaminated with the product should be discarded. Polyfluorinated polyethylene has been suggested.

OTHER CLOTHING AND EQUIPMENT:
Standard work clothing. Standard work shoes; discard if shoes cannot be decontaminated. Store contaminated clothing in well ventilated cabinets or closed containers. Wash contaminated clothing and dry before reuse. Shower and eyewash facilities should be accessible.

MONITORING EXPOSURE

BIOLOGICAL:
Analysis of blood for trichloro acetic acid and trichloro ethanol has been correlated with exposure; urinary concentration of these metabolites may also correlate with routine constant exposure but not as a quantitative index of exposure.

PERSONAL/AREA:
Use NIOSH Analytical method number 1003 for halogenated hydrocarbons.

VI. PHYSICAL DATA

BOILING POINT @ 760 mm Hg: 87.0°C

FREEZING POINT: -86.4°C

VAPOR PRESSURE: 73 mm Hg @ 25°C

SPECIFIC GRAVITY (H_2O=1): 1.45

SOLUBILITY IN H_2O % BY WT: 0.11

VAPOR DENSITY (Air=1): 4.54

APPEARANCE AND ODOR: Clear, colorless liquid with a sweet odor

pH: NA

EVAPORATION RATE (BuAc=1): 0.30

% VOLATILES BY VOL.: 100

X. ADDITIONAL INFORMATION

OSHA Standard 29CFR 1910.1200 requires that information be provided employees regarding the hazards of chemicals by means of a hazard communication program including labeling, material safety data sheets, training and access to written records.

Note: For additional Non-Emergency health, safety, or environmental information, telephone (716) 286-3081.

For Emergencies: 24 HOUR EMERGENCY PHONE: (716) 278-7021

WARNING LABEL INFORMATION

SIGNAL WORD: DANGER!

STATEMENT OF HAZARDS:
VOLATILE SOLVENT
PROLONGED BREATHING OF VAPOR CAN CAUSE DIZZINESS, LOSS OF CONSCIOUSNESS, LIVER AND KIDNEY DAMAGE, AND MAY RESULT IN DEATH.
CAUSES IRRITATION OF THE EYES, SKIN, AND RESPIRATORY TRACT.
MAY BE FATAL IF SWALLOWED.

PRECAUTIONARY STATEMENTS:
Do not get in eyes, on skin, on clothing.
Do not take internally.
Use only with adequate ventilation to maintain vapor exposure level below TLV.
Employ respiratory protection when exposure to vapor is possible.
When handling, wear chemical splash goggles, protective clothing and solvent-resistant gloves.
Wash thoroughly after handling
Never enter a pit or tank without observing safety procedures never alone, always with a life line and always with a positive supply of fresh air.
Avoid contact with flames, hot glowing surfaces, or alkali metals to prevent decomposition resulting in toxic and irritating vapors.
Keep container tightly closed.
Store in cool, ventilated place.
See Material Safety Data Sheet for more detailed information regarding safe handling.

FIRST AID:

IN CASE OF CONTACT:

FOR EYES:
Immediately flush with plenty of water for at least 15 minutes, holding eyelids apart to ensure flushing of the entire eye surface. SEEK MEDICAL ATTENTION IMMEDIATELY.

SKIN:
Wash contaminated areas with plenty of soap and water. A soothing ointment may be applied to irritated skin after thorough cleansing. Remove contaminated clothing and footwear and wash clothing before reuse. Discard footwear which cannot be decontaminated. SEEK MEDICAL ATTENTION.

INHALATION:
Remove to fresh air. If breathing has stopped give mouth-to-mouth resuscitation. If breathing is difficult, have trained person administer oxygen. GET IMMEDIATE MEDICAL ATTENTION.

IF SWALLOWED:
Immediate Treatment: DO NOT INDUCE VOMITING. If more than trace quantities have been swallowed and the patient is conscious, wash out mouth with water and give 200-300 ml (half a pint) of warm water to drink. Obtain immediate medical attention on site or transport to hospital.

NOTES TO PHYSICIAN:
Caution: Epinephrine or other stimulant may cause ventricular arrhythmia due to potentiation of endogenous epinephrine. Ethyl Alcohol markedly augments the health effects of trichloroethylene.

WARNING LABEL INFORMATION (Continued)

IN CASE OF:

SPILL OR LEAK:
Leaks should be stopped. Spills should be contained and cleaned up immediately. Large spills should be removed by vacuum truck. Smaller spills may be soaked up with absorbent material which should be placed in closed containers, labeled, and stored in a safe place out of doors to await proper disposal. Spilled material should be disposed of in accordance with federal, state and local regulations. Persons performing this work should wear adequate personal protective equipment and clothing.

FIRE:
Use carbon dioxide, dry chemicals, foam or water fog. Pressure-demand, self-contained breathing apparatus should be provided for fire fighters.

HANDLING AND STORAGE:
Store containers in a cool, dry, well ventilated area.

Package, store, transport and dispose of all waste material and any contaminated equipment in accordance with all applicable federal, state, and local health and environmental regulations. Shipments of waste materials are subject to regulations. Shipments of waste materials are subject to manifesting requirements per applicable regulations.

HMIS RATING SYSTEM: HEALTH 3* FLAMMABILITY 1 REACTIVITY 0

FOR INDUSTRIAL USE ONLY LABEL 111687M1103

Copy Pleasant

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
GENERAL CHEMICAL CORP	(617) 872-5000

ADDRESS (Number, Street, City, State, and ZIP Code)
33-138 LELAND STREET FRAMINGHAM, MA 01701

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
TRI STABILIZER COMPOUND	
CHEMICAL FAMILY	FORMULA

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS TRICHLOROETHYLENE	50	50	FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES ISOPROPYL AMINE	25	5	OTHERS		
OTHERS PROPYLENE OXIDE	25	10			

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	135°F	SPECIFIC GRAVITY (H_2O=1)	1.290
VAPOR PRESSURE (mm Hg.)		PERCENT, VOLATILE BY VOLUME (%)	100%
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER	SLIGHT		
APPEARANCE AND ODOR	STRONG AMMONIA ODOR		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
105°F			

EXTINGUISHING MEDIA
CO_2 OR DRY CHEMICAL

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

(Continued on reverse side)

TRW-02624

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SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
PPM 25

EFFECTS OF OVEREXPOSURE
Light-headedness, giddiness, shortness of breath, possible narcosis, possible cardiac arrhythmias at high concentrations.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation: Remove to fresh air, call a physician. Do not give epinephrine or simialar drums.

Skin or Eye Contact: Flush with water. May cause burns.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID: Open flames or high temperatures.
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*

HAZARDOUS DECOMPOSITION PRODUCTS
Hydrochloric and hydrofluoric acids--possible carbonyl halide.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Ventilate area--especially low places where heavy vapors might collect. Remove open flames.

WASTE DISPOSAL METHOD
Reclaim by distillation

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*
Use air mask in high concentrations.

VENTILATION	LOCAL EXHAUST: When large amounts are released	SPECIAL
	MECHANICAL *(General)*: Especially in low places	OTHER

PROTECTIVE GLOVES: When handling liquid	EYE PROTECTION: When handling liquid

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Store containers in a clean, dry area. Do not heat above 90°F.

OTHER PRECAUTIONS

U.S. G.P.O. 1983-381-271/2380

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29CFR 1910. 1200. Standard must be consulted for specific requirements.

~~Tri~~ Stabilizer Concentrate

QUICK IDENTIFIER
Common Name: (used on label and list)

SECTION 1 -

Manufacturer's Name	~~General Chemical~~ Corp.
Address	133-138 Le land Street
City, State, and ZIP	Framingham, MA 01701
Emergency Telephone No.	~~(508) 872-5000~~
Other Information Calls	
Signature of Person Responsible for Preparation (Optional)	
Date Prepared	

SECTION 2 – HAZARDOUS INGREDIENTS/IDENTITY

Hazardous Component(s) (chemical & common name(s))	OSHA PEL	ACGIH TLV	Other Exposure Limits	% (optional)	CAS NO.
Trichloroethylene		100PPM		50	79-01-6
Monoisopropylamine		5PPM		25	75-31-0
Propylene Oxide		100PPM		25	75-56-9

SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point	110°F	Specific Gravity (H,O=1)	1.2	Vapor Pressure (mm Hg)	120mmHg
	Vapor Density (Air = 1) 3.5				
Solubility in Water		Reactivity in Water			
Appearance and Odor	Water White, Clear	Melting Point			

SECTION 4 – FIRE & EXPLOSION DATA

Flash Point	60° F. C.	Method Used	Tag closed cup	Flammable Limits in Air % by Volume LEL Lower	UEL Upper 5%-19%
Auto-Ignition Temperature		Extinguisher Media	Alcohol Foam		
Special Fire Fighting Procedures					
Unusual Fire and Explosion Hazards	none				

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SECTION 5 – PHYSICAL HAZARDS (REACTIVITY DATA)

Stability: Unstable ☐ Stable ☒ — Conditions to Avoid: Heat, open fire or flames

Incompatability (Materials to Avoid): Strong Acids

Hazardous Decomposition Products: Hydrogen , Chlorine and other toxic vapors

Hazardous Polymerization: May Occur ☐ Will Not Occur ☒ — Conditions to Avoid

SECTION 6 – HEALTH HAZARDS

1. Acute 2. Chronic

Signs and Symptoms of Exposure: Vapors will be irritating and may also cause nausea and vomiting. Contact of liquid with eyes causes severe injury. Wet clothing may cause burns.

Medical Conditions Generally Aggravated by Exposure:

Chemical Listed as Carcinogen or Potential Carcinogen — National Toxicology Program: Yes ☐ No ☒ — I.A.R.C. Monographs: Yes ☐ No ☒ — OSHA: Yes ☐ No ☒

Emergency and First Aid Procedures: If inhaled, remove to fresh air. Give oxygen if breathing is difficult. Call a physician immediately. Flush eye contact with plenty of water for at least 15 minutes and then get medical care. Flush skin with water. Remove contaminated clothing.

ROUTES OF ENTRY

1. Inhalation: Remove to fresh air. Give oxygen if breathing is difficult. Call physician.
2. Eyes: Flush with plenty of water for at least 15 minutes then get medical care.
3. Skin: Flush with plenty of water. Remove contaminated clothing.
4. Ingestion:

SECTION 7 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken in Handling and Storage: Store in a Cool, Dry place designed for flammable liquids.

Other Precautions:

Steps to be Taken in Case Material is Released or Spilled: Eliminate sources of ignition. Wear protective clothing and self contained breathing apparatus. Collect in a waste container.

Waste Disposal Methods (Consult federal, state, and local regulations): Secure Land Fill

SECTION 8 – SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

Respiratory Protection (Specify Type): Chemical Vapor Mask or self contained breathing apparatus

Ventilation — Local Exhaust — Mechanical (General) — Special — Other

Protective Gloves: Vinyl, Rubber — Eye Protection: Splash Goggles

Other Protective Clothing or Equipment:

Work/Hygienic Practices:

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IMPORTANT
Do not leave any blank spaces. If required information is unavailable, unknown, or does not apply, so indicate.

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0908-4009

J.T.BAKER INC. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865
M A T E R I A L S A F E T Y D A T A S H E E T
24-HOUR EMERGENCY TELEPHONE -- (201) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

.00 <03 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE PAGE: 1
EFFECTIVE: 05/01/89 ISSUED: 05/17/89

J.T.BAKER INC., 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865

SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME: 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE
COMMON SYNONYMS: FREON 113; FLUOROCARBON 113; 1,1,2-TRICHLOROTRIFLUOROETHANE
CHEMICAL FAMILY: CHLORINATED HYDROCARBONS
FORMULA: CL2FCCF2CL
FORMULA WT.: 187.38
CAS NO.: 76-13-1
NIOSH/RTECS NO.: KJ4000000
PRODUCT USE: LABORATORY REAGENT
PRODUCT CODES: 9083,9343,9445,W591,9337

PRECAUTIONARY LABELING

BAKER SAF-T-DATA* SYSTEM

HEALTH	-	2	MODERATE
FLAMMABILITY	-	1	SLIGHT
REACTIVITY	-	0	NONE
CONTACT	-	2	MODERATE

LABORATORY PROTECTIVE EQUIPMENT

GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

U.S. PRECAUTIONARY LABELING

WARNING

CAUSES IRRITATION. HARMFUL IF INHALED.
AVOID CONTACT WITH EYES, SKIN, CLOTHING. KEEP IN TIGHTLY CLOSED CONTAINER.
WASH THOROUGHLY AFTER HANDLING.

INTERNATIONAL LABELING

AVOID CONTACT WITH EYES. AFTER CONTACT WITH SKIN, WASH IMMEDIATELY WITH PLENTY OF WATER. KEEP CONTAINER TIGHTLY CLOSED.

SAF-T-DATA* STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

CONTINUED ON PAGE: 2

SECTION II - COMPONENTS

COMPONENT	CAS NO.	WEIGHT %	OSHA/PEL	ACGIH/TLV
TRICHLOROTRIFLUOROETHANE	76-13-1	90-100	1000 PPM	1000 PPM

SECTION III - PHYSICAL DATA

BOILING POINT: 48 C (118 F)
(AT 760 MM HG)

VAPOR PRESSURE (MMHG): 285
(20 C)

MELTING POINT: -35 C (-31 F)
(AT 760 MM HG)

VAPOR DENSITY (AIR=1): 6.5

SPECIFIC GRAVITY: N/A
(H2O=1)

EVAPORATION RATE: N/A

SOLUBILITY(H2O): NEGLIGIBLE (<0.1%)

% VOLATILES BY VOLUME: 100
(21 C)

PH: N/A

ODOR THRESHOLD (P.P.M.): N/A

PHYSICAL STATE: LIQUID

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

APPEARANCE & ODOR: CLEAR, COLORLESS LIQUID. FAINT ETHER-LIKE ODOR.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS: UPPER - N/A LOWER - N/A

FIRE EXTINGUISHING MEDIA
USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE-FIGHTING PROCEDURES
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE.

CONTINUED ON PAGE: 3

SECTION IV - FIRE AND EXPLOSION HAZARD DATA (CONTINUED)

UNUSUAL FIRE & EXPLOSION HAZARDS
NONE IDENTIFIED.

TOXIC GASES PRODUCED
HALOGEN ACIDS, CARBON MONOXIDE, CARBON DIOXIDE, PHOSGENE, HALOGENS

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT
NONE IDENTIFIED.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE
NONE IDENTIFIED.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE (TLV/TWA): 7600 MG/M3 (1000 PPM)

SHORT-TERM EXPOSURE LIMIT (STEL): 9500 MG/M3 (1250 PPM)

PERMISSIBLE EXPOSURE LIMIT (PEL): 7600 MG/M3 (1000 PPM)

TOXICITY OF COMPONENTS

ORAL RAT LD50 FOR TRICHLOROTRIFLUOROETHANE 43 G/KG
CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO

CARCINOGENICITY
NONE IDENTIFIED.

REPRODUCTIVE EFFECTS
NONE IDENTIFIED.

EFFECTS OF OVEREXPOSURE

INHALATION: HEADACHE, NAUSEA, VOMITING, DIZZINESS, DROWSINESS, IRRITATION OF UPPER RESPIRATORY TRACT, UNCONSCIOUSNESS, MAY CAUSE NARCOSIS

SKIN CONTACT: DERMATITIS

CONTINUED ON PAGE: 4

SECTION V - HEALTH HAZARD DATA (CONTINUED)

EYE CONTACT: IRRITATION

SKIN ABSORPTION: NONE IDENTIFIED

INGESTION: GASTROINTESTINAL IRRITATION

CHRONIC EFFECTS: NONE IDENTIFIED

TARGET ORGANS
SKIN, HEART

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
NONE IDENTIFIED

PRIMARY ROUTES OF ENTRY
INHALATION, INGESTION, EYE CONTACT, SKIN CONTACT

EMERGENCY AND FIRST AID PROCEDURES

INGESTION: CALL A PHYSICIAN. IF SWALLOWED, DO NOT INDUCE VOMITING.

INHALATION: IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.

SKIN CONTACT: IN CASE OF CONTACT, FLUSH SKIN WITH WATER.

EYE CONTACT: IN CASE OF EYE CONTACT, IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

SARA/TITLE III HAZARD CATEGORIES AND LISTS

ACUTE: YES CHRONIC: YES FLAMMABILITY: NO PRESSURE: NO REACTIVITY: NO

EXTREMELY HAZARDOUS SUBSTANCE: NO
CERCLA HAZARDOUS SUBSTANCE: NO
TOXIC CHEMICALS: YES CONTAINS CHLORINATED FLUOROCARBON (FREON 113)
GENERIC CLASS: CO2
TSCA INVENTORY: YES

CONTINUED ON PAGE: 5

SECTION VI - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: HEAT, FLAME, OTHER SOURCES OF IGNITION

INCOMPATIBLES: ALKALI METALS, CHEMICALLY ACTIVE METALS, ZINC, ALUMINUM, MAGNESIUM

DECOMPOSITION PRODUCTS: HALOGEN ACIDS, CARBON MONOXIDE, CARBON DIOXIDE, PHOSGENE, HALOGENS

SECTION VII - SPILL & DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE
WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. STOP LEAK IF YOU CAN DO SO WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. TAKE UP WITH SAND OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIAL AND PLACE INTO CONTAINER FOR LATER DISPOSAL. FLUSH SPILL AREA WITH WATER.

DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION VIII - INDUSTRIAL PROTECTIVE EQUIPMENT

VENTILATION: USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.

RESPIRATORY PROTECTION: RESPIRATORY PROTECTION REQUIRED IF AIRBORNE CONCENTRATION EXCEEDS TLV. AT CONCENTRATIONS ABOVE 1000 PPM, A SELF-CONTAINED BREATHING APPARATUS IS ADVISED.

EYE/SKIN PROTECTION: SAFETY GOGGLES, UNIFORM, APRON, POLYVINYL ALCOHOL GLOVES ARE RECOMMENDED.

CONTINUED ON PAGE: 6

SECTION IX - STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA* STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

STORAGE REQUIREMENTS
KEEP CONTAINER TIGHTLY CLOSED. SUITABLE FOR ANY GENERAL CHEMICAL STORAGE AREA. STORE BELOW 45 C.

SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME: CHEMICALS, N.O.S. (NON-REGULATED)

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME: CHEMICALS, N.O.S. (NON-REGULATED)
MARINE POLLUTANTS: NO

AIR (I.C.A.O.)

PROPER SHIPPING NAME: CHEMICALS, N.O.S. (NON-REGULATED)

U.S. CUSTOMS HARMONIZATION NUMBER: 29034050201

EPA/TSCA EXPORT NOTIFICATION
YES

N/A = NOT APPLICABLE OR NOT AVAILABLE
N/E = NOT ESTABLISHED

THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET MEETS THE REQUIREMENTS OF THE UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ACT AND REGULATIONS PROMULGATED THEREUNDER (29 CFR 1910.1200 ET. SEQ.) AND THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. THIS DOCUMENT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE MATERIAL BY A PERSON TRAINED IN, OR SUPERVISED BY A PERSON TRAINED IN, CHEMICAL HANDLING. THE USER IS RESPONSIBLE FOR DETERMINING THE PRECAUTIONS AND DANGERS OF THIS CHEMICAL FOR HIS OR HER PARTICULAR APPLICATION. DEPENDING ON USAGE, PROTECTIVE CLOTHING INCLUDING EYE AND FACE GUARDS AND RESPIRATORS MUST BE USED TO AVOID CONTACT WITH MATERIAL OR BREATHING CHEMICAL VAPORS/FUMES.

CONTINUED ON PAGE: 7

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EXPOSURE TO THIS PRODUCT MAY HAVE SERIOUS ADVERSE HEALTH EFFECTS. THIS CHEMICAL MAY INTERACT WITH OTHER SUBSTANCES. SINCE THE POTENTIAL USES ARE SO VARIED, BAKER CANNOT WARN OF ALL OF THE POTENTIAL DANGERS OF USE OR INTERACTION WITH OTHER CHEMICALS OR MATERIALS. BAKER WARRANTS THAT THE CHEMICAL MEETS THE SPECIFICATIONS SET FORTH ON THE LABEL. BAKER DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.
THE USER SHOULD RECOGNIZE THAT THIS PRODUCT CAN CAUSE SEVERE INJURY AND EVEN DEATH, ESPECIALLY IF IMPROPERLY HANDLED OR THE KNOWN DANGERS OF USE ARE NOT HEEDED. READ ALL PRECAUTIONARY INFORMATION. AS NEW DOCUMENTED GENERAL SAFETY INFORMATION BECOMES AVAILABLE, BAKER WILL PERIODICALLY REVISE THIS MATERIAL SAFETY DATA SHEET. IF YOU HAVE ANY QUESTIONS, PLEASE CALL CUSTOMER SERVICE (1-800-JTBAKER) FOR ASSISTANCE.

===
APPROVED BY QUALITY ASSURANCE DEPARTMENT.

-- LAST PAGE --

add Sheet

APPENDIX D

Form Approved
Budget Bureau No. 44-R1387
Approval Expires April 30, 1971

Form No. LSB-DDS-4
May 1969

U.S. DEPARTMENT OF LABOR

WORKPLACE STANDARDS ADMINISTRATION
Bureau of Labor Standards

MATERIAL SAFETY DATA SHEET

SECTION I

1-800-243-6774

MANUFACTURER'S NAME: PPG Industries, Inc.	EMERGENCY TELEPHONE NO.: [redacted]
ADDRESS (Number, Street, City, State, and ZIP Code): No. 1 Gateway Center, Pittsburgh, Pa. 15222	
CHEMICAL NAME AND SYNONYMS: 1,1,1 Trichloroethane, methyl chloroform	TRADE NAME AND SYNONYMS: [redacted]
CHEMICAL FAMILY: Chlorinated, Hydrocarbons	FORMULA: CH_3CCl_3

SECTION III PHYSICAL DATA

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS	100	350	FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION II HAZARDOUS

BOILING POINT (°F.)	165.4	SPECIFIC GRAVITY (H_2O=1)	1.31
VAPOR PRESSURE (mm Hg.)	120	PERCENT VOLATILE BY VOLUME (%)	100
VAPOR DENSITY (AIR=1)	4.54	EVAPORATION RATE (_____=1)	0.35
SOLUBILITY IN WATER	Negligible		
APPEARANCE AND ODOR	Colorless appearance, ethereal odor		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	None (Tag, open or closed)	FLAMMABLE LIMITS	Lel / Uel
EXTINGUISHING MEDIA			
SPECIAL FIRE FIGHTING PROCEDURES			
UNUSUAL FIRE AND EXPLOSION HAZARDS	Vapors can be ignited only by high intensity source of ignition. Combustion forms HCl and possible traces of phosgene.		

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SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	350 ppm
EFFECTS OF OVEREXPOSURE	Loss of co-ordination and equilibrium to acutal unconsciousness, and even death, in unventilated areas (such as tanks).
EMERGENCY AND FIRST AID PROCEDURES	Move to fresh air, use artificial respiration if breathing has stopped. Administer oxygen after breathing has been restored. (Never administer adrenalin:) Call physician (he should not administer adrenalin.)

SECTION VI REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	
INCOMPATABILITY (Materials to avoid)	Avoid mixing with caustic soda and caustic potash.		
HAZARDOUS DECOMPOSITION PRODUCTS	HCl and possible traces of phosgene.		
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	Adequate ventilation must be provided. Workmen should be provided with fresh air mask or sent to fresh air.
WASTE DISPOSAL METHOD	Forced ventilation or evaporation.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)	Fresh air masks		
VENTILATION	LOCAL EXHAUST	Sufficient to maintain TLV	SPECIAL
	MECHANICAL (General)		OTHER
PROTECTIVE GLOVES	Neoprene or Viton	EYE PROTECTION	Glasses or goggles
OTHER PROTECTIVE EQUIPMENT	Neoprene apron		

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
OTHER PRECAUTIONS

RECEIVED
MAR 17 1992

PPG INDUSTRIES, INC. ONE PPG PLACE PITTSBURGH, PA 15272

* * * TRI-ETHANE(R) 377

MSDS NUMBER: 0278
DATE: 08/09/89
EDITION: 004
TRADE NAME: TRI-ETHANE(R) 377
CHEMICAL NAME/SYNONYMS: 1,1,1-TRICHLOROETHANE, METHLYCHLOROFORM
CHEMICAL FAMILY: HALOGENATED HYDROCARBONS
FORMULA: CH3CCL3 CAS NUMBER: 000071 55 6
U.S. DOT SHIPPING NAME: 1,1,1-TRICHLOROETHANE
U.S. DOT HAZARD CLASS: ORM-A
SUBSIDIARY RISK: N/A
I.D. NUMBER: UN2831
REPORTABLE QUANTITY: 1000 LBS/454 KG
ONLY REGULATED WHEN SHIPPED IN BULK OR BY AIR.
* STABILIZED FOR VAPOR DEGREASING AND GENERAL SOLVENT USE.

SECTION 1 * PHYSICAL DATA

. LING POINT @ 760 MM HG: 72 - 88 C
VAPOR DENSITY (AIR=1): 4.54
SPECIFIC GRAVITY (H20=1): 1.300-1.320 @ 25/25 C
PH OF SOLUTIONS: 6.0 TO 7.5
FREEZING/MELTING POINT: -45 C
SOLUBILITY (WEIGHT % IN WATER): NEGLIGIBLE
BULK DENSITY: 10.8-10.97 #/GAL @ 25 C
VOLUME % VOLATILE: 100
VAPOR PRESSURE: 135 MM HG @ 25 C
EVAPORATION RATE: (ETHYL ETHER=1): 0.35
HEAT OF SOLUTION: N/A
APPEARANCE AND ODOR:
CLEAR, COLORLESS LIQUID WITH ETHER-LIKE ODOR.

SECTION 2 * INGREDIENTS

MATERIAL	PERCENT
1,1,1-TRICHLOROETHANE (STABILIZED)	> 95
GLYCOL METHYLENE ETHER (CAS #646-06-0), SEC BUTANOL <2% (CAS #78-92-2), OTHER STABILIZERS	BALANCE

SECTION 3 * FIRE/EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED):
NONE

FLAMMABLE LIMITS IN AIR (% BY VOLUME)
LEL: 7%
UEL: 15%

EXTINGUISHING MEDIA:
WATER, DRY CHEMICALS OR CARBON DIOXIDE

SPECIAL FIRE FIGHTING PROCEDURES:
FIRE FIGHTERS SHOULD WEAR NIOSH/MSHA APPROVED PRESSURE DEMAND, SELF-CONTAINED BREATHING APPARATUS FOR POSSIBLE EXPOSURE TO HYDROGEN CHLORIDE AND POSSIBLE TRACES OF PHOSGENE.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
VAPORS CONCENTRATED IN A CONFINED OR POORLY VENTILATED AREA CAN BE IGNITED UPON CONTACT WITH A HIGH ENERGY SPARK, FLAME OR HIGH INTENSITY SOURCE OF HEAT. THIS CAN OCCUR AT CONCEN. RANGING BETWEEN 7-15% BY VOLUME. DECOMPOSITION OR BURNING WILL PRODUCE HYDROGEN CHLORIDE & POSSIBLE TRACES OF PHOSGENE.

SECTION 4 * HEALTH HAZARD DATA

TOXICITY DATA:

LC50 INHALATION:	(RAT) 14,250 PPM/7 HOURS
LD50 DERMAL:	(RABBIT) > 15 G/KG
SKIN/EYE IRRITATION:	SEE SECTION 5
LD50 INGESTION:	(RAT) 10-12 G/KG
FISH,LC50 (LETHAL CONCENTRATION):	UNKNOWN

CLASSIFICATION: (POISON, IRRITANT, ETC.)

INHALATION:	SLIGHTLY TOXIC
SKIN:	NOT SIGNIFICANTLY TOXIC
SKIN/EYE:	IRRITATING
INGESTION:	NOT SIGNIFICANTLY TOXIC
AQUATIC:	UNKNOWN

SECTION 5 * EFFECTS OF OVEREXPOSURE

THIS SECTION COVERS EFFECTS OF OVEREXPOSURE FOR INHALATION, EYE/SKIN CONTACT, INGESTION AND OTHER TYPES OF OVEREXPOSURE INFORMATION IN THE ORDER OF THE MOST HAZARDOUS AND THE MOST LIKELY ROUTE OF OVEREXPOSURE.

IS CHEMICAL LISTED AS A CARCINOGEN OR POTENTIAL CARCINOGEN?
NTP - NO IARC - NO OSHA - NO

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
NONE KNOWN.

PERMISSIBLE EXPOSURE LIMITS:
OSHA: 350 PPM, 8-HOUR TWA (TIME-WEIGHTED AVERAGE);
450 PPM, 15-MINUTE STEL (SHORT-TERM EXPOSURE LIMIT);
29 CFR 1910.1000, (REV. 3/1/89).

ACUTE:

INHALATION: TRI-ETHANE(R) IS PRIMARILY A CENTRAL NERVOUS SYSTEM DEPRESSANT. INHALATION CAN CAUSE IRRITATION OF THE RESPIRATORY SYSTEM, DIZZINESS, NAUSEA, LIGHTHEADEDNESS, HEADACHE, LOSS OF COORDINATION AND EQUILIBRIUM, UNCONSCIOUSNESS, POSSIBLE CENTRAL NERVOUS SYSTEM DAMAGE AND EVEN DEATH IN CONFINED OR POORLY VENTILATED AREAS. FATALITIES FOLLOWING SEVERE ACUTE EXPOSURE TO VARIOUS CHLORINATED SOLVENTS HAVE BEEN ATTRIBUTED TO VENTRICULAR FIBRILLATION.

AEROSOL - PRELIMINARY RESULTS FROM STUDIES IN RATS INDICATE THAT THE ACUTE INHALATION TOXICITY OF "AEROSOLIZED" 1,1,1-TRICHLOROETHANE IS HIGHER THAN EXPECTED BASED ON THE REPORTED ACUTE INHALATION TOXICITY OF 1,1,1-TRICHLOROETHANE VAPOR. THE SIGNIFICANCE OF THESE FINDINGS TO HUMAN HEALTH IN PRODUCT USE SITUATIONS IS NOT CLEARLY UNDERSTOOD.

EYE/SKIN: LIQUID SPLASHED IN THE EYE CAN RESULT IN DISCOMFORT, PAIN AND IRRITATION. PROLONGED OR REPEATED CONTACT WITH LIQUID ON THE SKIN CAN CAUSE IRRITATION AND DERMATITIS. THE PROBLEM MAY BE ACCENTUATED BY LIQUID BECOMING TRAPPED AGAINST THE SKIN BY CONTAMINATED CLOTHING AND SHOES, AND SKIN ABSORPTION CAN OCCUR.

INGESTION: SWALLOWING OF THIS MATERIAL MAY RESULT IN IRRITATION OF THE MOUTH AND GI TRACT WITH OTHER EFFECTS AS LISTED ABOVE FOR INHALATION.

VOMITING AND SUBSEQUENT ASPIRATION INTO LUNGS MAY LEAD TO CHEMICAL PNEUMONIA AND PULMONARY EDEMA WHICH IS A POTENTIALLY FATAL CONDITION. LD50 INGESTION: (RABBIT, GUINEA PIG) 5.6 - 9.5 G/KG.

CHRONIC:
TRI-ETHANE(R) HAS BEEN EXTENSIVELY STUDIED FOR CANCER POTENTIAL. THERE IS NO DOCUMENTED EVIDENCE TO SUGGEST THAT TRI-ETHANE(R) CAUSES AN INCREASED CANCER INCIDENCE IN HUMANS OR ANIMALS. THE EPA'S SCIENCE ADVISORY BOARD CONCLUDED THAT THERE IS NO EVIDENCE TO SUGGEST CARCINOGENIC ACTIVITY FOR TRI-ETHANE(R).

REPRODUCTIVE:
IN DEVELOPMENTAL TOXICITY STUDIES, THERE WAS NO EVIDENCE FOR BIRTH DEFECTS IN RATS OR RABBITS AFTER INHALATION EXPOSURE TO PREGNANT ANIMALS. NO ADVERSE FINDING RELATIVE TO REPRODUCTION OR DEVELOPMENTAL TOXICITY WERE OBSERVED FOLLOWING DAILY SIX-HOUR EXPOSURES AT OR BELOW 3000 PPM IN RATS OR RABBITS.

* EMERGENCY AND FIRST AID PROCEDURES

INHALATION:
REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

EYE OR SKIN CONTACT:
FLUSH EYES AND SKIN WITH PLENTY OF WATER (SOAP AND WATER FOR SKIN) FOR AT LEAST 15 MINUTES, WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. IF IRRITATION OCCURS, CONSULT A PHYSICIAN. THOROUGHLY CLEAN CONTAMINATED CLOTHING AND SHOES BEFORE REUSE OR DISCARD.

INGESTION:
IF CONSCIOUS, DRINK LARGE QUANTITIES OF WATER. DO NOT INDUCE VOMITING. TAKE IMMEDIATELY TO A HOSPITAL OR PHYSICIAN. IF UNCONSCIOUS, OR IN CONVULSIONS, TAKE IMMEDIATELY TO A HOSPITAL. DO NOT ATTEMPT TO INDUCE VOMITING OR GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

NOTES TO PHYSICIAN (INCLUDING ANTIDOTES):
NEVER ADMINISTER ADRENALINE FOLLOWING TRI-ETHANE(R) OVEREXPOSURE. INCREASED SENSITIVITY OF THE HEART TO ADRENALINE MAY BE CAUSED BY OVEREXPOSURE TO TRI-ETHANE(R).

SECTION 6 * REACTIVITY DATA

STABILITY: STABLE
CONDITIONS TO AVOID: OPEN FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS.
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.
CONDITIONS TO AVOID: NONE
INCOMPATIBILITY (MATERIALS TO AVOID):
AVOID MIXING WITH CAUSTIC SODA, CAUSTIC POTASH, OR OXIDIZING MATERIALS. SHOCK SENSITIVE COMPOUNDS MAY BE FORMED.
HAZARDOUS DECOMPOSITION PRODUCTS:
HYDROGEN CHLORIDE AND POSSIBLE TRACES OF PHOSGENE.

SECTION 7 * SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED:
IMMEDIATELY EVACUATE THE AREA AND PROVIDE MAXIMUM VENTILATION. UNPROTECTED PERSONNEL SHOULD MOVE UPWIND OF SPILL. ONLY PERSONNEL EQUIPPED WITH PROPER RESPIRATORY AND SKIN/EYE PROTECTION (SEE SECTION 8) SHOULD BE PERMITTED IN AREA. DIKE AREA TO CONTAIN SPILL. TAKE PRECAUTIONS AS NECESSARY TO PREVENT CONTAMINATION OF GROUND AND SURFACE WATERS. RECOVER SPILLED MATERIAL ON ADSORBENTS, SUCH AS SAWDUST OR VERMICULITE, AND SWEEP INTO CLOSED CONTAINERS FOR DISPOSAL. AFTER ALL VISIBLE TRACES, INCLUDING IGNITABLE VAPORS, HAVE BEEN REMOVED, THOROUGHLY WET VACUUM THE AREA. DO NOT FLUSH TO SEWER. IF AREA OF SPILL IS POROUS, REMOVE AS MUCH CONTAMINATED EARTH AND GRAVEL, ETC. AS NECESSARY AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.
WASTE DISPOSAL METHOD:
CONTAMINATED SAWDUST, VERMICULITE, OR POROUS SURFACES MUST BE DISPOSED OF IN A PERMITTED HAZARDOUS WASTED MANAGEMENT FACILITY. RECOVERED LIQUIDS MAY BE REPROCESSED OR INCINERATED OR MUST BE TREATED IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. CARE MUST BE TAKEN WHEN USING OR DISPOSING OF CHEMICAL MATERIALS AND/OR THEIR CONTAINERS TO PREVENT ENVIRONMENTAL CONTAMINATION. IT IS YOUR DUTY TO DISPOSE OF THE CHEMICAL MATERIALS AND/OR THEIR CONTAINERS IN ACCORDANCE WITH THE CLEAN AIR ACT, THE CLEAN WATER ACT, THE RESOURCE CONSERVATION AND RECOVERY ACT, AS WELL AS ANY OTHER RELEVANT FEDERAL, STATE, OR LOCAL LAWS/REGULATIONS REGARDING DISPOSAL.

SECTION 8 * SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

USE A HALF OR FULL FACEPIECE ORGANIC VAPOR CHEMICAL CARTRIDGE OR CANISTER RESPIRATOR WHEN CONCENTRATIONS EXCEED PERMISSIBLE LIMITS. USE SELF-CONTAINED BREATHING APPARATUS (SCBA) OR FULL FACEPIECE AIRLINE RESPIRATOR WITH AUXILIARY SCBA OPERATED IN THE PRESSURE-DEMAND MODE FOR EMERGENCIES AND FOR ALL WORK PERFORMED IN STORAGE VESSELS, POORLY VENTILATED ROOMS, AND OTHER CONFINED AREAS. RESPIRATORS MUST BE APPROVED BY NIOSH OR MSHA. THE RESPIRATOR USE LIMITATIONS MADE BY NIOSH/MSHA AND BY THE MANUFACTURER MUST BE OBSERVED. RESPIRATORY PROTECTION PROGRAMS MUST BE IN ACCORDANCE WITH 29 CFR 1910.134.

VENTILATION(TYPE):

USE LOCAL EXHAUST OR DILUTION VENTILATION AS APPROPRIATE TO CONTROL EXPOSURES TO BELOW PERMISSIBLE LIMITS.

EYE PROTECTION:

SPLASHPROOF GOGGLES

GLOVES:

VITON(R), SILVER SHIELD(R). FOR LIMITED SERVICES ONLY: POLYVINYL ALCOHOL (DEGRADES IN WATER).

OTHER PROTECTIVE EQUIPMENT:

BOOTS, APRONS, OR CHEMICAL SUITS SHOULD BE USED WHEN NECESSARY TO PREVENT SKIN CONTACT. PERSONAL PROTECTIVE CLOTHING AND USE OF EQUIPMENT MUST BE IN ACCORDANCE WITH 29 CFR 1910.132 AND 29 CFR 1910.133.

SECTION 9 * SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN DURING HANDLING AND STORING:

* DO NOT USE IN POORLY VENTILATED OR CONFINED SPACES WITHOUT PROPER RESPIRATORY PROTECTION (SEE SECTION 8).
* TRI-ETHANE(R) VAPORS ARE HEAVIER THAN AIR AND WILL COLLECT IN LOW AREAS.
* KEEP CONTAINER CLOSED WHEN NOT IN USE.
* STORE ONLY IN CLOSED, PROPERLY LABELED CONTAINERS.
* LIQUID OXYGEN OR OTHER STRONG OXIDANTS MAY FORM EXPLOSIVE MIXTURES WITH TRI-ETHANE(R).
* THIS MATERIAL OR ITS VAPORS WHEN IN CONTACT WITH FLAMES, HOT GLOWING SURFACES, OR ELECTRIC ARCS CAN DECOMPOSE TO FORM HYDROGEN CHLORIDE AND POSSIBLE TRACES OF PHOSGENE.
* AVOID CONTAMINATION OF WATER SUPPLIES. HANDLING, STORAGE, AND USE PROCEDURES MUST BE CAREFULLY MONITORED TO AVOID SPILLS OR LEAKS. ANY

SPILL OR LEAK HAS THE POTENTIAL TO CAUSE UNDERGROUND WATER CONTAMINATION WHICH MAY, IF SUFFICIENTLY SEVERE, RENDER A DRINKING WATER SOURCE UNFIT FOR HUMAN CONSUMPTION. CONTAMINATION THAT DOES OCCUR CANNOT BE EASILY CORRECTED.

* DO NOT STORE OR STACK ALUMINUM IN CONTACT WITH TRI-ETHANE(R) TO PREVENT POSSIBLE SOLVENT DECOMPOSITION (STACKING CORROSION).
* CAUTION SHOULD BE TAKEN NOT TO USE IN PRESSURIZED OR TOTALLY ENCLOSED SYSTEM OF ALUMINUM CONSTRUCTION. EXAMPLE: PAINT OR ADHESIVE SPRAY SYSTEM.
* A CHLORINATED SOLVENT USED AS A FLASHPOINT SUPPRESSANT MUST BE ADDED IN SUFFICIENT QUANTITY OR THE RESULTANT MIXTURE MAY HAVE A FLASHPOINT LOWER THAN THE FLAMMABLE COMPONENT.
* DO NOT USE CUTTING OR WELDING TORCHES ON EMPTY DRUMS THAT CONTAINED TRI-ETHANE(R) UNLESS PROPERLY PURGED AND CLEANED.

OTHER PRECAUTIONS:

* DO NOT BREATHE VAPORS. HIGH VAPOR CONCENTRATIONS CAN CAUSE DIZZINESS, UNCONSCIOUSNESS OR DEATH. LONG-TERM OVEREXPOSURE MAY CAUSE POSSIBLE CENTRAL NERVOUS SYSTEM DAMAGE.
* USE ONLY WITH ADEQUATE VENTILATION. VENTILATION MUST BE SUFFICIENT TO LIMIT EMPLOYEE EXPOSURE TO TRI-ETHANE(R) BELOW PERMISSIBLE EXPOSURE LIMITS. OBSERVANCE OF LOWER LIMITS (OUTLINED IN SECTION 5) IS ADVISABLE. EYE IRRITATION, DIZZINESS AND/OR DRUNKENNESS ARE SIGNS OF OVEREXPOSURE.
* AVOID CONTACT WITH EYES. WILL CAUSE IRRITATION AND PAIN.
* AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. MAY CAUSE IRRITATION OR DERMATITIS.
* DO NOT SWALLOW. SWALLOWING MAY CAUSE INJURY OR DEATH.
* DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS.

COMMENTS:

TSCA - 1,1,1-TRICHLOROETHANE IS ON THE TSCA INVENTORY UNDER CAS #71-55-6. TRI-ETHANE FORMULATIONS CONTAIN STABILIZERS THAT ARE LISTED ON THE TSCA INVENTORY.

SARA TITLE III - A) 311/312 CATEGORIES - ACUTE, B) LISTED IN SECTION 313 AS 1,1,1-TRICHLOROETHANE (METHYLCHLOROFORM), ALSO CONTAINS SEC BUTANOL WHICH IS LISTED IN SECTION 313, C) NOT LISTED AS AN "EXTREMELY HAZARDOUS SUBSTANCE" IN SECTION 302.

CERCLA - LISTED IN TABLE 302.4 OF 40 CFR PART 302 AS A HAZARDOUS SUBSTANCE WITH A REPORTABLE QUANTITY OF 1000 POUNDS, RELEASES TO AIR, LAND, OR WATER WHICH EXCEED THE RQ MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

RCRA - WASTE 1,1,1-TRICHLOROETHANE AND CONTAMINATED SOILS/MATERIALS FROM SPILL CLEANUP ARE U226 HAZARDOUS WASTE AS PER 40 CFR 261.33 AND MUST BE DISPOSED OF ACCORDINGLY UNDER RCRA. SEE 40 CFR 261.33(C) AND 261.7(B)(3)

FOR CLEANING REQUIREMENTS FOR EMPTY CONTAINERS.

CALIFORNIA PROP. 65 - THIS PRODUCT CONTAINS ETHYLENE DICHLORIDE, A PROCESS IMPURITY AT LESS THAN 0.1%. PROP. 65 LISTS THIS COMPOUND AS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

CANADA WHMIS - SENSITIZATION TO PRODUCT: NONE KNOWN; REPRODUCTIVE TOXICITY: NONE KNOWN; ODOR THRESHOLD: NOT KNOWN; PRODUCT USE: DEGREASING SOLVENT; REQUIRES POISON SYMBOL (CLASS D.1).

R. KENNETH LEE
MANAGER, PRODUCT SAFETY

10762

McGean-Rohco, Inc.

1250 Terminal Tower, Cleveland, Ohio 44113, 216/621-8425

MATERIAL SAFETY DATA SHEET

Product Name:	TRU-PLATE COPPER COAT 00327		Emergency Phone No.: 216/441-4900
Plant Address:	2910 HARVARD AVENUE CLEVELAND, OH 44105		Chemtrec Phone No. 800/424-9300
Prepared By:	TSCA COORDINATOR	Issue Date: 10/90	Revised Date: 5/91

INGREDIENTS AND HAZARDOUS COMPONENTS

Material	%	TLV	C.A.S. #	Suspect Carcinogen
COPPER SULFATE [SARA 313 CHEMICAL]	35-45	1*	7758-99-8	NO
		mg/M3		
*AS COPPER				

PHYSICAL DATA

Boiling Point: NA	Freezing Point: NA	Specific Gravity: UK	pH: NA
Vapor Pressure at 20° C: NA	Vapor Density (Air = 1): NA	% Volatiles by Volume: NA	Odor: NONE
Evaporation Rate (Butyl Acetate = 1) NA		Solubility in Water: APPRECIABLE	
Appearance and Form: LIGHT BLUE-WHITE CRYSTALS			

FIRE AND EXPLOSION HAZARD DATA

Flash Point: NA		Flammable Limits in Air:	
Test Method: NA		% By Volume	Upper: NA Lower:
Extinguishing Media: NA			
Special Fire Fighting Procedures: NA			
Unusual Fire and Explosion Hazards: NONE			
DOT Classification: CLASS 9	UN-3077	Note: UK = Unknown	NA = Not Applicable

TRW-02645

TRU-PLATE COPPER COAT 0032/

HEALTH HAZARD DATA

Effects of Overexposure and Primary Entries to Body:

PRIMARY ENTRY THROUGH CONTACT.
MAY IRRITATE SKIN, EYES, UPPER RESPIRATORY TRACT.
CHRONIC: COULD CAUSE BLOOD DAMAGE

Emergency and First Aid Procedures:

FLUSH SKIN WITH WATER.
FLUSH EYES WITH WATER FOR 15 MINUTES.
IF ANY IRRITATION PERSISTS, SEE A PHYSICIAN.

REACTIVITY DATA

☒ Stable ☐ Unstable Conditions to Avoid:

Incompatability — Materials to Avoid: NA

Hazardous Decomposition Products: OXIDES OF SULFUR

Hazardous Polymerization: ☐ May Occur ☒ Will Not Occur

SPILL OR LEAK PROCEDURES

Spills:

SCOOP, VA UUM UP

Waste Disposal Methods:

LANDFILL

FOLLOW ALL LOCAL, STATE AND FEDERAL REGULATIONS.

SPECIAL PROTECTION INFORMATION

Respirator: IF TLV IS EXCEEDED, MUST BE NIOSH OR MSHA APPROVED.

Ventilation: SUFFICIENT TO KEEP BELOW TLV LIMIT

Gloves:	Eye and Face:	Other:
RUBBER	SAFETY GLASSES	SUFFICIENT TO PREVENT SKIN CONTACT

Handling and Storage:

STORE IN A COOL, DRY AREA

THIS PRODUCT SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION.

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McGEAN-ROHCO, INC.
MATERIAL SAFETY DATA SHEET

PRODUCT NAME: TRU-PLATE GALVIT EXT. 2951-E
MSDS No.: 10695
REVISION: 2
PREPARED BY: TSCA COORDINATOR ISSUE DATE: 05/01/91 REVISION DATE: 03/18/94

SECTION A. MATERIAL IDENTIFICATION.

MANUFACTURER: McGEAN-ROHCO, INC.

38521 SCHOOLCRAFT AVE.
LIVONIA MI 48150
TELEPHONE: 313-872-1800

CHEMTREC:
TELEPHONE #: 800-424-9300

SECTION B. INGREDIENTS AND HAZARDS.

INGREDIENT: SODIUM BISULFATE

CAS NUMBER: 7681-38-1 20.0 - 30.0%
EXPOSURE LIMIT: TWA: NONE ESTABLISHED
SUSPECT CARCINOGEN: NO

INGREDIENT: TIN, INORGANIC COMPOUND

CAS NUMBER: 7440-31-5 40.0 - 50.0%
EXPOSURE LIMIT: TWA: 2mg/CUBIC METER AS TIN
SUSPECT CARCINOGEN: NO

SECTION C. PHYSICAL DATA.

APPEARANCE: WHITE TO OFF WHITE SOLID
ODOR: NONE

BOILING POINT: NA
FREEZING POINT: NA

SPECIFIC GRAVITY: NA
pH: NA

VAPOR PRESSURE: NA
VAPOR DENSITY: NA
% VOLATILE BY VOLUME: NA
EVAPORATION RATE: NA
SOLUBILITY IN WATER: APPRECIABLE

SECTION D. FIRE AND EXPLOSION HAZARD DATA.

FLASH POINT: NONE
TEST METHOD: NA

LIMITS: LEL: NA
UEL: NA

HAZARD SYMBOL CODES

	NFPA	HMIS
HEALTH:	2	2
FLAMMABILITY:	0	0
REACTIVITY:	0	0
SPECIAL:		

0908-4029

PRODUCT NAME: TRU-PLATE GALVIT EXT. 2951-E MSDS No.: 10695
REVISION: 2
PREPARED BY: TSCA COORDINATOR ISSUE DATE:05/01/91 REVISION DATE: 03/18/94

EXTINGUISHING MEDIA: NOT. FLAMMABLE.

SPECIAL FIRE FIGHTING PROCEDURES: NONE.

UNUSUAL FIRE OR EXPLOSION HAZARDS: NONE.

SECTION E. REACTIVITY DATA.

MATERIAL IS STABLE.
HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

CONDITIONS TO AVOID: NA

CHEMICAL INCOMPATIBILITIES: KNOWN NONE

HAZARDOUS DECOMPOSITION PRODUCTS: OXIDES OF SULFUR.

SECTION F. HEALTH HAZARD DATA.

SUMMARY OF RISKS: SARA-ACUTE

MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY CONTACT: NONE KNOWN.

TARGET ORGANS: SKIN,EYES,RESPIRATORY SYSTEM.

PRIMARY ENTRY ROUTES: THROUGH CONTACT AND INHALATION OF DUST.

ACUTE EFFECTS: IRRITATING TO SKIN. CORROSIVE TO EYES.

CHRONIC EFFECTS: NONE KNOWN.

SIGNS & SYMPTOMS OF OVEREXPOSURE:
EYE CONTACT: BURNING OR STINGING SENSATION.

SKIN CONTACT: NONE TO IRRITATION.

INHALATION: IRRITATION OF RESPIRATORY SYSTEM.

INGESTION: IRRITATION OF MOUTH AND THROAT.

PRODUCT NAME: TRU-PLATE GALVIT EXT. 2951-E MSDS No.: 10695
REVISION: 2
PREPARED BY: TSCA COORDINATOR ISSUE DATE:05/01/91 REVISION DATE: 03/18/94

WORKPLACE CONSIDERATIONS:
VENTILATION: NORMAL.
SAFETY STATIONS: EYE WASH.
OTHER:

SECTION I. SPECIAL PRECAUTIONS.

SPECIAL HANDLING & STORAGE PROCEDURES: STORE IN A COOL DRY AREA TO PREVENT CAKING.

D.O.T. CLASS: NONE UN REGISTER: NONE
IMCO CLASS: NONE UN REGISTER: NONE

EXPLANATION OF SYMBOLS
NA = NOT APPLICABLE UK = UNKNOWN

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PRODUCT NAME: TRU-PLATE GALVIT EXT. 2951-E MSDS No.: 10695
REVISION: 2
PREPARED BY: TSCA COORDINATOR ISSUE DATE:05/01/91 REVISION DATE: 03/18/94

EMERGENCY & FIRST AID PROCEDURES:

EYE CONTACT: FLUSH EYES WITH WATER FOR 15 MINUTES. GET MEDICAL ATTENTION.

SKIN CONTACT: FLUSH WITH WATER THEN WASH WITH SOAP AND WATER.

INHALATION: REMOVE TO FRESH AIR.

INGESTION: IF CONSCIOUS,GIVE SEVERAL GLASSES OF WATER AND INDUCE VOMITING. GET MEDICAL ATTENTION.

SECTION G. SPILL, LEAK AND DISPOSAL PROCEDURES.

SPILL/LEAK PROCEDURES: SCOOP OR SWEEP UP. FLUSH RESIDUAL TRACES AWAY WITH WATER. FOLLOW ALL LOCAL,STATE,AND FEDERAL REGULATIONS.

WASTE MANAGEMENT & DISPOSAL PROCEDURES: LANDFILL OR DISSOLVE IN WATER, NEUTRALIZE TO WITHIN POTW pH DISCHARGE LIMITS AND SEWER.

RCRA # (IF DISPOSED AS RECEIVED): NONE

SECTION H. SPECIAL PROTECTION INFORMATION

PERSONAL PROTECTIVE EQUIPMENT:

GOGGLES: SAFETY GLASSES.
GLOVES: RUBBER OR NEOPRENE
RESPIRATOR: DUST MASK RECOMMENDED.

OTHER: SUFFICIENT TO PREVENT SKIN CONTACT.

RUN: 11/23/92 11:29:10 AM McGEAN-ROHCO, INC. PAGE 1
MATERIAL SAFETY DATA SHEET

PRODUCT NAME: TRU-PLATE SURF PREP CHEM 0170 MSDS No.: 10618
REVISION: 2
PREPARED BY: TSCA COORDINATOR ISSUE DATE:04/01/88 REVISION DATE: 07/07/92

SECTION A. MATERIAL IDENTIFICATION.

MANUFACTURER: McGEAN-ROHCO, INC.
CHEMTREC:
TELEPHONE #:800-424-9300

2910 HARVARD AVE.
CLEVELAND OH 44105
TELEPHONE: 216-441-4900

SECTION B. INGREDIENTS AND HAZARDS.

INGREDIENT: SULFURIC ACID---SARA 313 CHEMICAL

CAS NUMBER:7664-93-9 40.0 - 50.0%
EXPOSURE LIMIT: TWA:1mg/CU METER
SUSPECT CARCINOGEN: NO

SECTION C. PHYSICAL DATA.

APPEARANCE: LIGHT TAN LIQUID.
ODOR: BLAND
BOILING POINT: >100C
FREEZING POINT: UK

SPECIFIC GRAVITY: 1.4
pH: <1
VAPOR PRESSURE: UK
VAPOR DENSITY: UK
% VOLATILE BY VOLUME: NA
EVAPORATION RATE: <BUTYL ACETATE
SOLUBILITY IN WATER: COMPLETE

SECTION D. FIRE AND EXPLOSION HAZARD DATA.

FLASH POINT: NONE
TEST METHOD: NA

LIMITS: LEL: NA
UEL: NA

HAZARD SYMBOL CODES

	NFPA	HMIS
HEALTH:	3	3
FLAMMABILITY:	0	0
REACTIVITY:	1	1
SPECIAL:		

EXTINGUISHING MEDIA: NOT FLAMMABLE

SPECIAL FIRE FIGHTING PROCEDURES: SELFCONTAINED BREATHING APPARATUS AND FULL PROTECTIVE GEAR SHOULD BE WORN.

UNUSUAL FIRE OR EXPLOSION HAZARDS: CONTACT WITH METALS MAY GENERATE FLAMMABLE AND EXPLOSIVE HYDROGEN GAS.

TRW-02651

0908-4033

PRODUCT NAME: TRU-PLATE SURF PREP CHEM 0170 MSDS No.: 10618
REVISION: 2
PREPARED BY: TSCA COORDINATOR ISSUE DATE:04/01/88 REVISION DATE: 07/07/92

SECTION E. REACTIVITY DATA.

MATERIAL IS STABLE.
HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

CONDITIONS TO AVOID: NA

CHEMICAL INCOMPATIBILITIES: ALKALIES.

HAZARDOUS DECOMPOSITION PRODUCTS: IF INVOLVED IN FIRE, OXIDES OF SULFUR COULD BE GIVEN OFF.

SECTION F. HEALTH HAZARD DATA.

SUMMARY OF RISKS: SARA--ACUTE AND CHRONIC

MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY CONTACT: DERMATITIS.

TARGET ORGANS: SKIN,EYES,LUNGS.

PRIMARY ENTRY ROUTES: THROUGH CONTACT OR INHALATION OF MIST.

ACUTE EFFECTS: IRRITATION OR BURNING.

CHRONIC EFFECTS: AFFECT TARGET ORGANS. MAMMALIAN REPRODUCTIVE TOXIN.

SIGNS & SYMPTOMS OF OVEREXPOSURE:

EYE CONTACT: CORROSION WITH POSSIBLE CORNEAL ULCERATION.

SKIN CONTACT: SKIN BURNS OR ULCERATION.

INHALATION: IRRITATION OF UPPER RESPIRATORY PASSAGES.

INGESTION: SEVERE BURNS TO MUCOUS MEMBRANES OF THE MOUTH AND ESOPHAGUS.

PRODUCT NAME: TRU-PLATE SURF PREP CHEM 0170 MSDS No.: 10618
REVISION: 2
PREPARED BY: TSCA COORDINATOR ISSUE DATE:04/01/88 REVISION DATE: 07/07/92

EMERGENCY & FIRST AID PROCEDURES:

EYE CONTACT: FLUSH WITH WATER FOR 15 MINUTES. GET MEDICAL ATTENTION.

SKIN CONTACT: FLUSH WITH WATER FOR 15 MINUTES. IF ANY IRRITATION PERSISTS, GET MEDICAL ATTENTION.

INHALATION: REMOVE TO FRESH AIR.

INGESTION: DO NOT INDUCE VOMITING. IF CONSCIOUS,GIVE 2 GLASSES OF WATER AND GET MEDICAL ATTENTION. NOTE TO PHYSCIAN: ACTIVATED CHARCOAL SLURRY MAY BE ADMINISTERED.

SECTION G. SPILL, LEAK AND DISPOSAL PROCEDURES.

SPILL/LEAK PROCEDURES: SOAK UP WITH SAWDUST,SAND,OIL DRY, OR OTHER ABSORBANT MATERIAL. NEUTRALIZE RESIDUE WITH SODA ASH OR LIME AND FLUSH TO SEWER.

WASTE MANAGEMENT & DISPOSAL PROCEDURES: NEUTRALIZE WITH LIME OR SODA ASH TO WITHIN POTW pH DISCHARGE LIMITS AND SEWER WITH WATER. FOLLOW ALL LOCAL,STATE,AND FEDERAL REGULATIONS.

RCRA # (IF DISPOSED AS RECEIVED): D002

SECTION H. SPECIAL PROTECTION INFORMATION

PERSONAL PROTECTIVE EQUIPMENT:

GOGGLES: CHEMICAL GOGGLES.
GLOVES: RUBBER.
RESPIRATOR: IF TWA IS EXCEEDED,MUST BE NIOSH OR MSHA APPROVED.
OTHER: SUFFICIENT TO PREVENT SKIN CONTACT.

PRODUCT NAME: TRU-PLATE SURF PREP CHEM 0170 MSDS No.: 10618
REVISION: 2
PREPARED BY: TSCA COORDINATOR ISSUE DATE:04/01/88 REVISION DATE: 07/07/92

WORKPLACE CONSIDERATIONS:
VENTILATION: SUFFICIENT TO KEEP BELOW TWA LIMIT.
SAFETY STATIONS: EYE WASH.
OTHER: SAFETY SHOWER.

SECTION I. SPECIAL PRECAUTIONS.

SPECIAL HANDLING & STORAGE PROCEDURES: DO NOT STORE WITH STRONG BASES.

D.O.T. CLASS: 8.0 UN REGISTER: UN-1760
IMCO CLASS: 8.0 UN REGISTER: UN-1760

EXPLANATION OF SYMBOLS
NA = NOT APPLICABLE UK = UNKNOWN

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McGean-Rohco, Inc.

1250 Terminal Tower, Cleveland, Ohio 44113, 216/621-6425

MATERIAL SAFETY DATA SHEET

Product Name: Tru-Plate Universal Plating Accelerator 7090, 7091		Emergency Phone No.: (516) 334-0777
Plant Address: 131 Jericho Turnpike, Suite 103, Jericho, N.Y. 11753		Chemtrec Phone No. 800/424-9300
Prepared By: Walter Schwartz	Issue Date: 10/8/86	Revised Date:

INGREDIENTS AND HAZARDOUS COMPONENTS

Material	%	TLV	C.A.S. #	Suspect Carcinogen
Stannous Oxide >	20	2 MG/M3	21651-19-4	
Formaldehyde <	0.15	3MG/M3	50-00-0	Yes

PHYSICAL DATA

Boiling Point: NA	Freezing Point: NA	Specific Gravity: UK	pH: 1% slurry 5.0 - 6.0
Vapor Pressure at 20°C: NA	Vapor Density (Air = 1): NA	% Volatiles by Volume: NA	Odor: slight aromatic
Evaporation Rate (Butyl Acetate = 1) NA		Solubility in Water: Slight	
Appearance and Form: Grayish powdery mixture			

FIRE AND EXPLOSION HAZARD DATA

Flash Point: NA	Flammable Limits in Air:
Test Method: NA	% By Volume Upper: NA Lower:
Extinguishing Media: Water, dry chemical.	
Special Fire Fighting Procedures: Avoid contact with skin and eyes. Avoid inhalation of fum If necessary, use self-contained breathing apparatus and protective clothing.	
Unusual Fire and Explosion Hazards: Irritating fumes may develop when product is heated.	
DOT Classification: Not regulated except for ORM-E air shipments	Note: UK = Unknown NA = Not Applic

0908-4037

TRW-02655

Health Hazards from Overexposure and Primary Entries to Body: May cause skin and eye irritation. Inhalation of fumes or dust may be irritating to the respiratory tract. Formaldehyde is listed by NTP as a suspect carcinogen.

Emergency and First Aid Procedures: Flush affected area thoroughly with clean water. For eye contact, flush thoroughly with water and get medical attention.

REACTIVITY DATA

☒ Stable ☐ Unstable Conditions to Avoid:

Incompatability — Materials to Avoid: Avoid contact with oxidizers. Keep dry; material is hydroscopic.

Hazardous Decomposition Products:
Oxides of tin.

Hazardous Polymerization:
☐ May Occur ☒ Will Not Occur

SPILL OR LEAK PROCEDURES

Spills:
Sweep up and transfer to waste treating operation.

Waste Disposal Methods:
Material may be hazardous to aquatic life. Follow all federal, state and local requirements for treatment and disposal of tin metal containing and acidic wastes.

SPECIAL PROTECTION INFORMATION

Respirator:
Use NIOSH approved dust respirator.

Ventilation:
Mechanical - Sufficient to maintain below TLV.

Gloves: Plastic or rubber	Eye and Face: Goggles	Other: Protective clothing to prevent skin contact.

Handling and Storage:
Store to prevent physical damage to container. Store in a cool, dry area. Keep container closed when not in use.

0908-4038

TRW-02656

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
[redacted]	[redacted]

ADDRESS (Number, Street, City, State, and ZIP Code): 47-16 Austel Place, Long Island City, New York 11101

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
Sulfuric Acid containing mixture	[redacted] Tru-Plate 0170

CHEMICAL FAMILY	FORMULA
Mineral Acid Solution	H_2SO_4 containing mixture

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)		SPECIFIC GRAVITY (H_2O=1)	1.38
VAPOR PRESSURE (mm Hg.)		PERCENT, VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER	Complete		

APPEARANCE AND ODOR: Light tan liquid with soapy odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
N.A.	N.A.		

EXTINGUISHING MEDIA: Dry chemical

SPECIAL FIRE FIGHTING PROCEDURES: Liquid is acidid and corrosive: wear protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Contact of solution with metals may generate flammable and explosive hydrogen gas.

(Continued on reverse side)

TRW-02657

0908-4039

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
1 MG/M^3

EFFECTS OF OVEREXPOSURE
May cause burns to skin, eyes and body tissue on contact. Inhalation of vapors may cause respiratory irritation.

EMERGENCY AND FIRST AID PROCEDURES
Flush contacted area with plenty of water for 15 minutes. Remove contaminated clothing. For eye contact get medical attention.

SECTION VI - REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*
Metals, reducing agents

HAZARDOUS DECOMPOSITION PRODUCTS
Hydrogen, sulfur dioxide, sulfur trioxide

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Wear protective clothing in contaminated area. Remove reactable material from area. Flush area with large volume of water; neutralize with lime or soda ash.

WASTE DISPOSAL METHOD
Neutralize with lime, caustic or soda ash and flush with water.

Neutralization may produce heat and/or effervescence.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*
None for normal use.

VENTILATION		
	LOCAL EXHAUST: Use with adequate ventilation.	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES	EYE PROTECTION
Rubber or plastic	Chemical safety goggles, face shield.

OTHER PROTECTIVE EQUIPMENT
Rubber boots, aprons.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Protect against physical damage. Wear protective acid resistant clothing when handling solution. Acidic corrosive liquid, reacts with metals liberating hydrogen gas. Generates heat when mixed with water.

OTHER PRECAUTIONS

GPO 834-160

TRW-02658

0908-4040

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
Waldes Kohinoor, Inc.	(800) 367-3100

ADDRESS (Number, Street, City, State, and ZIP Code)
47-16 Austel Place, Long Island City, NY 11101

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
DEFOAMER	Waldes Tri-Plate — 290600

CHEMICAL FAMILY	FORMULA
Water Based - Silicone Emulsion	

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	212°F	SPECIFIC GRAVITY (H_2O=1)	1.0
VAPOR PRESSURE (mm Hg.)	30 mm	PERCENT, VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER			

APPEARANCE AND ODOR: Turbid water emulsion; very slight odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
None			

EXTINGUISHING MEDIA
Carbon Dioxide or Foam

SPECIAL FIRE FIGHTING PROCEDURES

None

UNUSUAL FIRE AND EXPLOSION HAZARDS

None

TRW-02659

(Continued on reverse side)

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

EFFECTS OF OVEREXPOSURE: May cause eye irritation

EMERGENCY AND FIRST AID PROCEDURES: Flush thoroughly with water.

SECTION VI - REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*: Silicon Dioxide- Carbon Dioxide Incompletely burned carbon residues

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Mop up or soak up with absorbent material

WASTE DISPOSAL METHOD: Land fill

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES | EYE PROTECTION: Safety Goggles

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Keep from freezing.

OTHER PRECAUTIONS

GPO 934-190

Form OSHA-20
Rev. May 72

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
Waldes Kohinoor, Inc.	(212) 392-3100

ADDRESS (Number, Street, City, State, and ZIP Code)
47-16 Austel Place, Long Island City, New York 11101

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
Stannous Tin containing mixture	Waldes Tri-Flow 2020, 2021

CHEMICAL FAMILY	FORMULA

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)		SPECIFIC GRAVITY (H_2O=1)	
VAPOR PRESSURE (mm Hg.)		PERCENT, VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER	Soluble		

APPEARANCE AND ODOR: White to tannish powder, little or no odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
Auto ignition temperature 620°F			

EXTINGUISHING MEDIA
Dry chemical - water

SPECIAL FIRE FIGHTING PROCEDURES
None

UNUSUAL FIRE AND EXPLOSION HAZARDS
None

TRW-02661

(Continued on reverse side)

0908-4043

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Not established

EFFECTS OF OVEREXPOSURE
May cause irritation of skin, eyes and respiratory system.

EMERGENCY AND FIRST AID PROCEDURES
In case of contact, flush affected area with plenty of water for 15 minutes, for eyes, get medical attention.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Sweep up spill, flush area with water.

WASTE DISPOSAL METHOD
Observe local regulations for disposal of chemical wastes containing tin salts.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*
Use respirator in the event of heavy dusting.

VENTILATION	LOCAL EXHAUST Use with adequate ventilation.	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES Gloves, rubber or plastic	EYE PROTECTION Chemical safety goggles

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Protect container against physical damage. Wear protective clothing when handling. Launder contaminated clothing before reuse.

OTHER PRECAUTIONS
Store in a cool dry area

GPO 934-180

0908-4044

Lab Experimental

McGean-Rohco, Inc.

1250 Terminal Tower, Cleveland, Ohio 44113, 216/621-6425

MATERIAL SAFETY DATA SHEET

APPROVED
MAY 05 1987
ENVIRONMENTAL ENGINEERING

Product Name: Tru-Plate Universal Plating Accelerator #090, #091	Emergency Phone No. (516) 334-6777
Plant Address: 131 Jericho Turnpike, Suite 103, Jericho, N.Y. 11753	Chemtrec Phone No. 800/424-9300
Prepared By: Walter Schwartz	Issue Date: 10/8/86 — Revised Date:

INGREDIENTS AND HAZARDOUS COMPONENTS

Material	%	TLV	C.A.S. #	Suspect Carcinogen
Stannous Oxide	20	2 MG/M3	21651-19-4	
Formaldehyde	0.15	3MG/M3	50-00-0	Yes

PHYSICAL DATA

Boiling Point: NA	Freezing Point: NA	Specific Gravity: UK	pH: 1% slurry 5.0 - 6.0
Vapor Pressure at 20° C: NA	Vapor Density (Air = 1): NA	% Volatiles by Volume: NA	Odor: slight aromatic
Evaporation Rate (Butyl Acetate = 1) NA		Solubility in Water: Slight	
Appearance and Form: Grayish powdery mixture			

FIRE AND EXPLOSION HAZARD DATA

Flash Point: NA	Flammable Limits in Air: % By Volume — Upper: NA — Lower:
Test Method: NA	
Extinguishing Media: Water, dry chemical.	
Special Fire Fighting Procedures: Avoid contact with skin and eyes. Avoid inhalation of fum If necessary, use self-contained breathing apparatus and protective clothing.	
Unusual Fire and Explosion Hazards: Irritating fumes may develop when product is heated.	
DOT Classification: Not regulated except for ORM-B air shipments	Note: UK = Unknown NA = Not Appli

TRW-02663

0908-4045

Effects of Overexposure and Primary Entries to Body: May cause skin and eye irritation. Inhalation of fumes or dust may be irritating to the respiratory tract. Formaldehyde is listed by NTP as a suspect carcinogen.

Emergency and First Aid Procedures: Flush affected area thoroughly with clean water. For eye contact, flush thoroughly with water and get medical attention.

REACTIVITY DATA

☒ Stable ☐ Unstable Conditions to Avoid:

Incompatability — Materials to Avoid: Avoid contact with oxidizers. Keep dry; material is hydroscopic.

Hazardous Decomposition Products:
Oxides of tin.

Hazardous Polymerization:
☐ May Occur ☒ Will Not Occur

SPILL OR LEAK PROCEDURES

Spills:
Sweep up and transfer to waste treating operation.

Waste Disposal Methods:
Material may be hazardous to aquatic life. Follow all federal, state and local requirements for treatment and disposal of tin metal containing and acidic wastes.

SPECIAL PROTECTION INFORMATION

Respirator:
Use NIOSH approved dust respirator.

Ventilation:
Mechanical - Sufficient to maintain below TLV.

Gloves:	Eye and Face:	Other:
Plastic or rubber	Goggles	Protective clothing to prevent skin contact.

Handling and Storage:
Store to prevent physical damage to container. Store in a cool, dry area. Keep container closed when not in use.

Surface Preparation Dept. - Experimental

McGean-Rohco, Inc.

1250 Terminal Tower, Cleveland, Ohio 44113, 216/621-6425

MATERIAL SAFETY DATA SHEET

Product Name: Tru-Plate Two [redacted]			Emergency Phone No.: 216/441-4900
Plant Address: 2910 Harvard Avenue	Cleveland, OH 44109		Chemtrec Phone No. 800/424-9300
Prepared By: TSCA Coordinator		Issue Date: 10/85	Revised Date: NA

INGREDIENTS AND HAZARDOUS COMPONENTS

Material	%	TLV	C.A.S. #	Suspect Carcinogen
Sulfuric Acid <	50	1	7664-93-9	NA
Copper Chloride <	5	1	7447-39-4	NA
		MG/M^3		

APPROVED

JUN 2 9 1987

ENVIRONMENTAL ENGINEERING

PHYSICAL DATA

Boiling Point: >100°C	Freezing Point: UK	Specific Gravity: 1.37-1.39	pH: less than 1.0
Vapor Pressure at 20°C: UK	Vapor Density (Air = 1): UK	% Volatiles by Volume: >50%	Odor: Bland-soapy
Evaporation Rate (Butyl Acetate = 1): less than 1.0		Solubility in Water: complete	
Appearance and Form: Greenish blue clear liquid.			

FIRE AND EXPLOSION HAZARD DATA

Flash Point: NA	Flammable Limits in Air: % By Volume	Upper:
Test Method: NA		Lower: NA

Extinguishing Media: Water - Dry chemical.

Special Fire Fighting Procedures: Liquid is acidic and corrosive. Wear suitable protective clothing. Wear self-contained breathing apparatus if fumes or mists are present.

Unusual Fire and Explosion Hazards: Contact of solution with metals may generate flammable and explosive hydrogen gas. Solution, when heated, may liberate chlorine gas.

DOT Classification: Corrosive RQ-10# UN 1760

Note: UK = Unknown NA = Not Applicable

0908-4047

TRW-02665

Effects of Overexposure and Primary Entries to Body:

May cause severe burns to skin, eyes and body tissue on contact. Inhalation of vapors may cause respiratory irritation.

Emergency and First Aid Procedures:

Flush contacted area thoroughly with clean water. Remove contaminated clothing. For eye contact, get medical attention.

REACTIVITY DATA

☑ Stable ☐ Unstable Conditions to Avoid:

Incompatability — Materials to Avoid:
Avoid contact with metals, reducing or oxidizing agents.

Hazardous Decomposition Products: Extremely high temperatures may liberate sulfur dioxide and chlorine gas.

Hazardous Polymerization: ☐ May Occur ☒ Will Not Occur

SPILL OR LEAK PROCEDURES

Spills: Soak up small spills with sand, clay or other suitable absorbant. Neutralize with lime or soda ash. Flush area with water. Comply with all federal, state and local regulations and requirements.

Waste Disposal Methods:

Neutralize and comply with all federal, state and local regulations for waste disposal.

SPECIAL PROTECTION INFORMATION

Respirator:
As required for general work area.

Ventilation:
Mechanical - Sufficient to maintain concentration below TLV.

Gloves:	Eye and Face:	Other:
Rubber	Goggles and face shield	Acid resistant clothing to prevent skin & clothing contact.

Handling and Storage: Store container to prevent physical damage. Keep container closed when not in use. Make sure closure is fastened securely before opening container. Material generates heat when mixed with water. Do not add water to material in container.

THIS PRODUCT SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION.

McGEAN-ROHCO, INC. PROVIDES NO WARRANTIES, EITHER EXPRESS OR IMPLIED, AND ASSUMES NO RESPONSIBILITY FOR ACCURACY OR COMPLETENESS OF THE DATA CONTAINED HEREIN.

Franklin Oil

Franklin Oil Corporation (Ohio)
Box 46030,
Cleveland, Ohio 44146-0030
Telephone: 216-232-3000

6/22/89

Dept 232

ATTN: SAFETY DIRECTOR
TRW INC.
FASTENER DIVISION
265 THIRD STREET
CAMBRIDGE MA
021420000

RE: UPDATED MATERIAL SAFETY DATA SHEET(S)

Enclosed you will find updated material safety data sheet(s) for the products(s) listed below corresponding to your order reference no. 14631
These material safety data sheet(s) conform to CFR 29 Part 1910.1200 ('Federal Right to Know Law').

[redacted]

Thank you for your interest in Franklin Oil products. We will continue to keep you advised of any new information concerning the safe handling of our products.

Regards,

FRANKLIN OIL CORP. (OHIO)

Ted McClure
Vice President-Technical

/s
Enclosure(s)

used on Stainless
Elliot will try Everform
8/16/90

Morgan

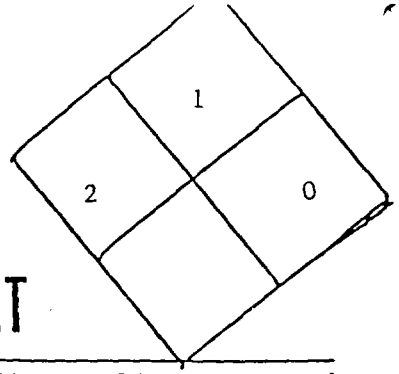
MASSACHUSETTS MSDS

Form Approved
Budget Bureau No. 44-R1367

U.S. DEPARTMENT OF LABOR

WORKPLACE STANDARDS ADMINISTRATION

Bureau of Labor Standards



MATERIAL SAFETY DATA SHEET

2021-2816

FORMULA / TRADE SECRET	SECTION I	
MANUFACTURER'S NAME: FRANKLIN OIL CORP.(OHIO)		EMERGENCY TELEPHONE NO.: 216/ 232-3000
ADDRESS (Number, Street, City, State, and ZIP Code): BOX 46030 - FRANKLIN PARK, CLEVELAND, OHIO 44146		
IDENTITY: TUF-DRAW 2806-M-100		DATE PREPARED: 4/18/89
CHEMICAL FAMILY: PETROLEUM HYDROCARBON		

SECTION II HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENTS:	OSHA PEL	ACGIH TLV.	%
SEVERELY HYDROTREATED NAPHTHENIC DISTILLATES	TWA $5mg/M^3$	TWA $5mg/M^3$	25-45
CAS #64742-52-5		STEL $10mg/M^3$	
TRIETHANOLAMINE CAS #102-71-6	NOT ESTABLISHED		1-10
PROPRIETARY INGREDIENTS NOT FOUND ON THE MOST			
RECENT MSL			

SECTION III PHYSICAL DATA

BOILING POINT (°F.)	>400°F.	SPECIFIC GRAVITY (H_2O=1)	1.116
VAPOR PRESSURE (mm Hg.)	<1	PERCENT VOLATILE BY VOLUME (%)	<1
VAPOR DENSITY (AIR=1)	>1	EVAPORATION RATE (BUTYL ACETATE =1)	<1
SOLUBILITY IN WATER	DISPERSABLE	pH	
APPEARANCE AND ODOR	DARK AMBER LIQUID WITH PETROLEUM ODOR	MELTING POINT	<40°F.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	350°F. (ASTM D-92)	FLAMMABLE LIMITS	Lel: NOT DETERMINED / Uel
EXTINGUISHING MEDIA	WATER FOG, DRY CHEMICAL, CO_2, OR FOAM		
SPECIAL FIRE FIGHTING PROCEDURES	WEAR SELF CONTAINED BREATHING APPARATUS		
	KEEP FIRE EXPOSED CONTAINERS COOL WITH WATER		
UNUSUAL FIRE AND EXPLOSION HAZARDS	HOT VAPORS FORM EXPLOSIVE MIXTURES WITH AIR.		

TRW-02668

0908-4050

SECTION V: REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	SPARKS AND OPEN FLAMES
INCOMPATABILITY (Materials to avoid)		STRONG ACIDS AND OXIDANTS	
HAZARDOUS DECOMPOSITION PRODUCTS UPON COMBUSTION:		CO, CO_2, CL_2, HCl, PHOSGENE, OXIDES OF SULPHUR	
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	NONE

SECTION VI: HEALTH HAZARD DATA

ROUTE(s) OF ENTRY:	INHALATION?	SKIN?	INGESTION?
	X	X	X

HEALTH HAZARDS (ACUTE & CHRONIC): CAUSES IRRITATION: MAY BE SKIN DEFATTER UPON PROLONGED OR REPEATED CONTACT. CAUSES EYE IRRITATION. INHALATION OF OIL MIST MAY CAUSE MILD RESPIRATORY IRRITATION. INGESTION: SMALL AMOUNTS ASPIRATED INTO LUNGS DURING INGESTION OR VOMITING MAY CAUSE CHEMICAL PNEUMONITIS.

CARCINOGENICITY:	NTP?	IARC MONOGRAPHS?	OSHA REGULATED?
	NOT LISTED	NOT LISTED	NOT LISTED

CHLORINATED PARAFFINS ARE A CLASS OF COMPOUNDS THAT ARE SIMILARLY MANUFACTURED BUT WHICH VARY IN MOLECULAR STRUCTURE BY CARBON CHAIN LENGTH AND DEGREE OF CHLORINATION. THE CHLORINATED PARAFFIN IN THIS PARTICULAR PRODUCT HAS NOT BEEN SHOWN TO HAVE ADVERSE HEALTH EFFECTS. WHILE TESTS HAVE BEEN CONDUCTED BY THE NATIONAL TOXICOLOGY PROGRAM ON OTHER SPECIFIC CHLORINATED PARAFFINS, THE RELEVANCE OF THESE STUDIES TO THIS PARTICULAR MATERIAL, IF ANY, HAS NOT BEEN DETERMINED.

SIGNS & SYMPTOMS OF EXPOSURE: OIL MIST INHALATION MAY CAUSE DIZZINESS, NAUSEA, AND DIFFICULTY BREATHING.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: SENSITIVE DRY SKIN

EMERGENCY AND FIRST AID PROCEDURES: IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN. WASH SKIN WITH SOAP AND WATER. IF SWALLOWED, DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION. REMOVE FLUID SOAKED CLOTHING AND SHOES. LAUNDER BEFORE REUSE. IF INHALED, REMOVE TO FRESH AIR AND GIVE ARTIFICAIL RESPIRATION IF NECESSARY. CALL A PHYSICIAN.

SECTION VII PRECAUTIONS FOR SAFE HANDLING USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: IN CASE OF SPILL, DO NOT USE WATER, SOAK UP WITH SAND, EARTH, OR OTHER INERT MATERIAL. PUT IN A SUITABLE CONTAINER. DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

WASTE DISPOSAL METHOD: DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS. AVOID CONTAMINATION OF SEWERS AND WATERWAYS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: AVOID CONTACT WITH EYES, SKIN AND CLOTHING. REMOVE CONTAMINATED CLOTHING, LAUNDER BEFORE REUSE. WASH THOROUGHLY AFTER HANDLING.

OTHER PRECAUTIONS: SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUE, FOLLOW LABEL WARNINGS EVEN AFTER CONTAINER IS EMPTIED.

SECTION VIII CONTROL MEASURES

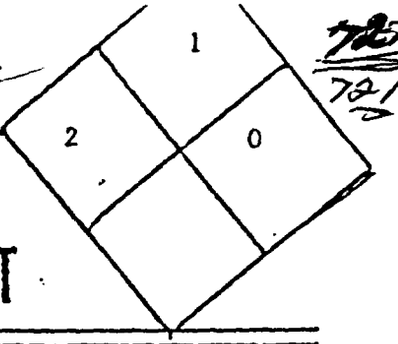
RESPIRATORY PROTECTION (Specify type) NIOSH APPROVED RESPIRATOR IF EXPOSED TO HOT VAPOR OR MIST			
VENTILATION	LOCAL EXHAUST: RECOMMENDED	SPECIAL: N/A	
	MECHANICAL (General): NOT DETERMINED	OTHER: N/A	
PROTECTIVE GLOVES: NEOPRENE OIL IMPERVIOUS		EYE PROTECTION: SAFETY GLASSES OR GOGGLES	
OTHER PROTECTIVE EQUIPMENT: USE AS REQUIRED TO AVOID SKIN CONTACT			

HYGENIC PRACTICES: WASH AFTER HANDLING

MASSACHUSETTS MSDS crystal

Form Approved
Budget Bureau No. 44-R1387

U.S. DEPARTMENT OF LABOR
WORKPLACE STANDARDS ADMINISTRATION
Bureau of Labor Standards



MATERIAL SAFETY DATA SHEET

2021-6161

FORMULA / TRADE SECRET · SECTION I	
MANUFACTURER'S NAME [redacted]	EMERGENCY TELEPHONE NO. [redacted]
ADDRESS (Number, Street, City, State, and ZIP Code) BOX 46030 - FRANKLIN PARK, CLEVELAND, OHIO 44146	
IDENTITY TUF-DRAW 2806HF	DATE PREPARED 4/26/89
CHEMICAL FAMILY [redacted]	

SECTION II HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENTS:	OSHA PEL	ACGIH TLV.	%
SEVERELY HYDROTREATED NAPTHENIC DISTILLATES	TWA 5mg/M^3	TWA 5mg/M^3	20-40
CAS #64742-52-5 AND CAS #64742-53-6		STEL 10mg/M^3	
TRIETHANOLAMINE CAS #102-71-6	NOT ESTABLISHED		1-5
PROPRIETARY INGREDIENTS NOT FOUND ON THE MOST			
RECENT MSL.			

SECTION III PHYSICAL DATA

BOILING POINT (°F.)	>415°F	SPECIFIC GRAVITY (H_2O=1)	1.068
VAPOR PRESSURE (mm Hg.) (70°F.)	<1	PERCENT VOLATILE BY VOLUME (%)	<2%
VAPOR DENSITY (AIR=1)	>1	EVAPORATION RATE (BUTYL ACETATE =1)	<1
SOLUBILITY IN WATER	EMULSIFIABLE	pH	8.6
APPEARANCE AND ODOR	AMBER OIL WITH PETROLEUM ODOR	MELTING POINT	<30°F.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) 325°F. (ASTM D-92)	FLAMMABLE LIMITS	Lel NOT DETERMINED	Uel
EXTINGUISHING MEDIA WATER FOG, DRY CHEMICAL, CO_2, OR FOAM	AUTOIGNITION TEMP.	>450°F.	
SPECIAL FIRE FIGHTING PROCEDURES WEAR SELF CONTAINED BREATHING APPARATUS.			
KEEP FIRE EXPOSED CONTAINERS COOL WITH WATER.			
UNUSUAL FIRE AND EXPLOSION HAZARDS HOT VAPORS FORM EXPLOSIVE MIXTURES WITH AIR.			

SECTION V. REACTIVITY DATA

SILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	SPARKS AND OPEN FLAMES
INCOMPATABILITY (Materials to avoid)	STRONG ACIDS AND OXIDANTS		
HAZARDOUS DECOMPOSITION PRODUCTS UPON COMBUSTION:	CO, CO_2, HCl, OXIDES OF SULFUR AND NITROGEN		
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	NONE

SECTION VI HEALTH HAZARD DATA

ROUTE(s) OF ENTRY:	INHALATION?	SKIN?	INGESTION?
	X	X	X

HEALTH HAZARDS (ACUTE & CHRONIC): CAUSES IRRITATION: MAY BE SKIN DEFATTER UPON PROLONGED OR REPEATED CONTACT. CAUSES EYE IRRITATION. INHALATION OF OIL MIST MAY CAUSE MILD RESPIRATORY IRRITATION. INGESTION: SMALL AMOUNTS ASPIRATED INTO LUNGS DURING INGESTION OR VOMITING MAY CAUSE CHEMICAL PNEUMONITIS.

CARCINOGENICITY:	NTP?	IARC MONOGRAPHS?	OSHA REGULATED?
	NOT LISTED	NOT LISTED	NOT LISTED

SIGNS & SYMPTOMS OF EXPOSURE: OIL MIST INHALATION MAY CAUSE DIZZINESS, NAUSEA AND DIFFICULTY BREATHING.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: SENSITIVE DRY SKIN.

EMERGENCY AND FIRST AID PROCEDURES: IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINS. CALL A PHYSICIAN. WASH SKIN WITH SOAP AND WATER. IF SWALLOWED DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION. REMOVE CONTAMINATED FLUID SOAKED CLOTHING AND SHOES. LAUNDER BEFORE REUSE. IF INHALED, REMOVE TO FRESH AIR AND GIVE ARTIFICIAL RESPIRATION IF NECESSARY. CALL A PHYSICIAN.

SECTION VII PRECAUTIONS FOR SAFE HANDLING USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: IN CASE OF SPILL, CONTAIN AND RECOVER BULK FLUID. DO NOT USE WATER. SOAK UP RESIDUE WITH SAND, EARTH OR OTHER INERT MATERIAL. PUT IN A SUITABLE CONTAINER. DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

WASTE DISPOSAL METHOD: DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. AVOID CONTAMINATION OF SEWERS AND WATERWAYS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: AVOID CONTACT WITH EYES, SKIN AND CLOTHING. REMOVE CONTAMINATED CLOTHING. LAUNDER BEFORE REUSE. WASH THOROUGHLY AFTER HANDLING.

OTHER PRECAUTIONS: SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUE, FOLLOW LABEL WARNINGS EVEN AFTER CONTAINER IS EMPTIED. DO NOT MIX THIS PRODUCT WITH NITRITES DUE TO THE POSSIBILITY OF A REACTION PRODUCING NITROSAMINES. AVOID BREATHING MIST OR HOT VAPORS.

SECTION VIII CONTROL MEASURES

RESPIRATORY PROTECTION (Specify type) NIOSH APPROVED RESPIRATOR IF EXPOSED TO HOT VAPOR OR MIST.

VENTILATION	LOCAL EXHAUST RECOMMENDED	SPECIAL	N/A
	MECHANICAL (General) N/A	OTHER	N/A
PROTECTIVE GLOVES	NEOPRENE-OIL IMPERVIOUS	EYE PROTECTION	SAFETY GLASSES OR GOGGLES
OTHER PROTECTIVE EQUIPMENT	USE AS REQUIRED TO AVOID SKIN CONTACT.		

HYGENIC PRACTICES: WASH AFTER HANDLIN.

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FRANKLIN OIL CORP. (Ohio)

40 SOUTH PARK STREET — P.O. BOX 46030

216 232-3000 CLEVELAND, OHIO 44146 TELEX 810 427-2270

TECHNICAL INFORMATION

For further application data or specifications, contact Technical Sales Division / Collect Phone Calls Accepted.

LUBRICANTS 3/79 1 1

PRODUCT LINE _____ PAGE _____ OF _____

TUF-DRAW D&S COMPOUND 21167Z

TRADE NAME _____

Tuf-Draw D&S Compound 21167Z is a complex chemical combination of highly refined petroleum hydrocarbons, chlorinated additives, fatty esters, non-ionic emulsifiers, rust inhibitors and algaecide.

21167Z will make a very stable emulsion with water in all proportions.

Case histories speak louder than words regarding the performance of this product.

Company "A" reports they are drawing a brake piston from a flat blank of 1070 commerical steel, 4 1/4" in diameter and 1/4" thick. The pigmented paste used prior to the introduction of 21167Z was causing excessive scoring of the dies and pigment build-up. They are now using 21167Z cut with two parts water and are meeting production schedules for the first time.

Company "B" was blanking and piercing 1080 spring steel 0.180" x 4 1/2" x 21". Previous oil products were used neat. 40,000 parts were made before sharpening the dies. 21167Z gives 250,000 hits before sharpening and is being cut one part compound to three parts water.

Company "C" was using a "honey oil" neat to form an automotive motor mount from 1010 hot rolled, pickled and oiled stock. Scrap rates ran as high as 85%. They switched to 21167Z cut at one part compound to one part water. Scrap rate plunged to less than 5% even when steel was varying from good to very poor quality.

The unique blend of additives in 21167Z afford the best rust protection available today and will practically eliminate staining.

SPECIFICATIONS:

Saybolt Viscosity @ 210°F	100/120 SUS
Flash Point (C.O.C.)	350° F.
Wt./Gallon	9.00 lbs.
E.P. Additives & Emulsifiers	65.5%
Mineral Oil (Heavy)	24.5%

0908-4056

TRW-02674

Form Approved
Budget Bureau No. 44-R1387

U.S. DEPARTMENT OF LABOR

WORKPLACE STANDARDS ADMINISTRATION

Bureau of Labor Standards

2021-2880

MATERIAL SAFETY DATA SHEET

SECTION I

MANUFACTURER'S NAME: FRANKLIN OIL CORP.(OHIO)	EMERGENCY TELEPHONE NO.: 216/ 232-3000
ADDRESS (Number, Street, City, State, and ZIP Code): BOX 46030 - FRANKLIN PARK, CLEVELAND, OHIO 44146	
CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS: TUF-DRAW D&S COMPOUND 21167Z
CHEMICAL FAMILY: PETROLEUM HYDROCARBON	FORMULA

SECTION II HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS	N/A		BASE METAL	N/A	
CATALYST	N/A		ALLOYS	N/A	
VEHICLE	N/A		METALLIC COATINGS	N/A	
SOLVENTS	N/A		FILLER METAL PLUS COATING OR CORE FLUX	N/A	
ADDITIVES	N/A		OTHERS	N/A	
OTHERS	N/A				

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
NONE	N/A	

SECTION III PHYSICAL DATA

BOILING POINT (°F.)	N/A	SPECIFIC GRAVITY (H_2O=1)	1.14
VAPOR PRESSURE (mm Hg.)	N/A	PERCENT VOLATILE BY VOLUME (%)	NONE
VAPOR DENSITY (AIR=1)	N/A	EVAPORATION RATE (_____=1)	N/A
SOLUBILITY IN WATER	NONE		
APPEARANCE AND ODOR	CLEAR BROWN OIL, MILD ODOR		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	ASTM D-92 350°F	FLAMMABLE LIMITS	Lel N/A	Uel N/A
EXTINGUISHING MEDIA	WATER FOG, FOAM, CARBON DIOXIDE, DRY CHEMICAL.			

SPECIAL FIRE FIGHTING PROCEDURES

WATER MAY CAUSE FOAMING IF USED ON MATERIAL IN BULK. VAPORS FROM HOT MATERIALS FORM EXPLOSIVE MIXTURES WITH AIR.

UNUSUAL FIRE AND EXPLOSION HAZARDS

SLIGHTLY HAZARDOUS TO HEALTH. SELF-CONTAINED BREATHING APPARATUS RECOMMENDED IN FIRE-FIGHTING. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

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SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	UNKNOWN
EFFECTS OF OVEREXPOSURE	NO NOXIOUS VAPORS UNLESS HEATED OR BURNING. SKIN CONTACT MAY BE IRRITANT TO PERSON WITH SENSITIVE SKIN.
EMERGENCY AND FIRST AID PROCEDURES	SKIN CONTACT - ORDINARY MEASURES OF PERSONAL HYGIENE SHOULD BE ADEQUATE. EXCESSIVE INHALATION OF HOT VAPORS - TREAT FOR SUFFOCATION! SECURE MEDICAL ATTENTION. EYE CONTACT - FLUSH WITH WATER. SECURE MEDICAL ATTENTION. IF SWALLOWED - DO NOT INDUCE VOMITING. CALL A PHYSICIAN.

SECTION VI REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	
INCOMPATABILITY *(Materials to avoid)*	STRONG OXIDIZING AGENTS		
HAZARDOUS DECOMPOSITION PRODUCTS	CHLORINE, HYDROGEN CHLORIDE		
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

RECOVER BULK MATERIAL IF POSSIBLE. SOAK UP WITH SAND AND REMOVE TO DISPOSAL AREA.

WASTE DISPOSAL METHOD

BURY IN AUTHORIZED LAND FILL AREA.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)* SELF CONTAINED BREATHING APPARATUS IF MATERIAL IS HOT.

VENTILATION	LOCAL EXHAUST		SPECIAL
	MECHANICAL *(General)*	USE IN VENTILATED AREA	OTHER
PROTECTIVE GLOVES	RECOMMENDED	EYE PROTECTION	SAFETY GOGGLES
OTHER PROTECTIVE EQUIPMENT	WEAR PROTECTIVE CLOTHING WHERE HOT MATERIAL MAY CONTACT SKIN.		

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SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
GENERAL PERSONAL HYGIENE ADVISABLE. STORE AWAY FROM EXCESSIVE HEAT [illegible]
PRECAUTIONS IN HANDLING ORDINARY COMBUSTIBLE LIQUIDS.

0908-4058

OTHER PRECAUTIONS
SECURE SOURCES OF IGNITION WHILE HANDLING. FUMES FROM HOT MATERIAL ARE HEAVIER THAN AIR AND MAY TRAVEL A CONSIDERABLE DISTANCE TO A SOURCE OF IGNITION AND FLASH BACK.

Arnel Co. Inc.
P.O. BOX 2003 DANVERS, MA 01923
(617) 744-5952

Technical Data Bulletin

TUFFY STONE CARPETTING

CHEMICAL RESISTANT (CR)

PRODUCT DESCRIPTION: Tuffy CR is a two component 100% Solid Epoxy flooring system for use in enviroments where the ultimate chemical resistance is required.

SPECIFICATION: All surface preparation and application shall conform to Arnel Co. Inc. specification titled Tuffy Stone Carpetting Type I with the single exception of substituting 19-9844 CR Curing agent in place of the Standard Tuffy Cure 19-0224.

CHEMICAL RESISTANCE:

The following list of substances were found to have no effect on the Tuffy CR flooring system under normal conditions. This list is not all inclusive. The concentrations found on this list represent those which are commonly found and does not necessarily mean that the system will fail if subjected to a higher concentration.

Sulfuric Acid, 10%
Hydrochloric Acid, 10%
Phosphoric Acid, 10%
Citric Acid, 10%
Linseed Oil fatty Acid
Sodium Hydroxide, 20%
Sodium Hydroxide, 50%
Ammonium Hydroxide, 29%
Sea Water
Tap Water
Distilled Water
Sodium Sulfite, 1%
Butyl Acetate
Ethyl Acetate
Isopropyl Acetate
Isopropyl Alcohol
Ethyl Alcohol

Zinc Hydrosulfite, 1%
Calcium Hypochlorite, 5%
Sodium Hypochlorite, 5%
Butyl Alcohol
Ethylene Glycol
Lard
Cottonseed Oil
Mineral Oil
Sour Crude Oil
Hydrogen Peroxide, 20%
Formaldehyde, 37%
Methyl Ethyl Ketone
Acetone
Methyl IsoButyl Ketone
Toluene
Xylene
Lacquer Thinner

L-122